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The Department of the Navy automatic data processing program as influenced by government-wide management policies.

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George Washington University

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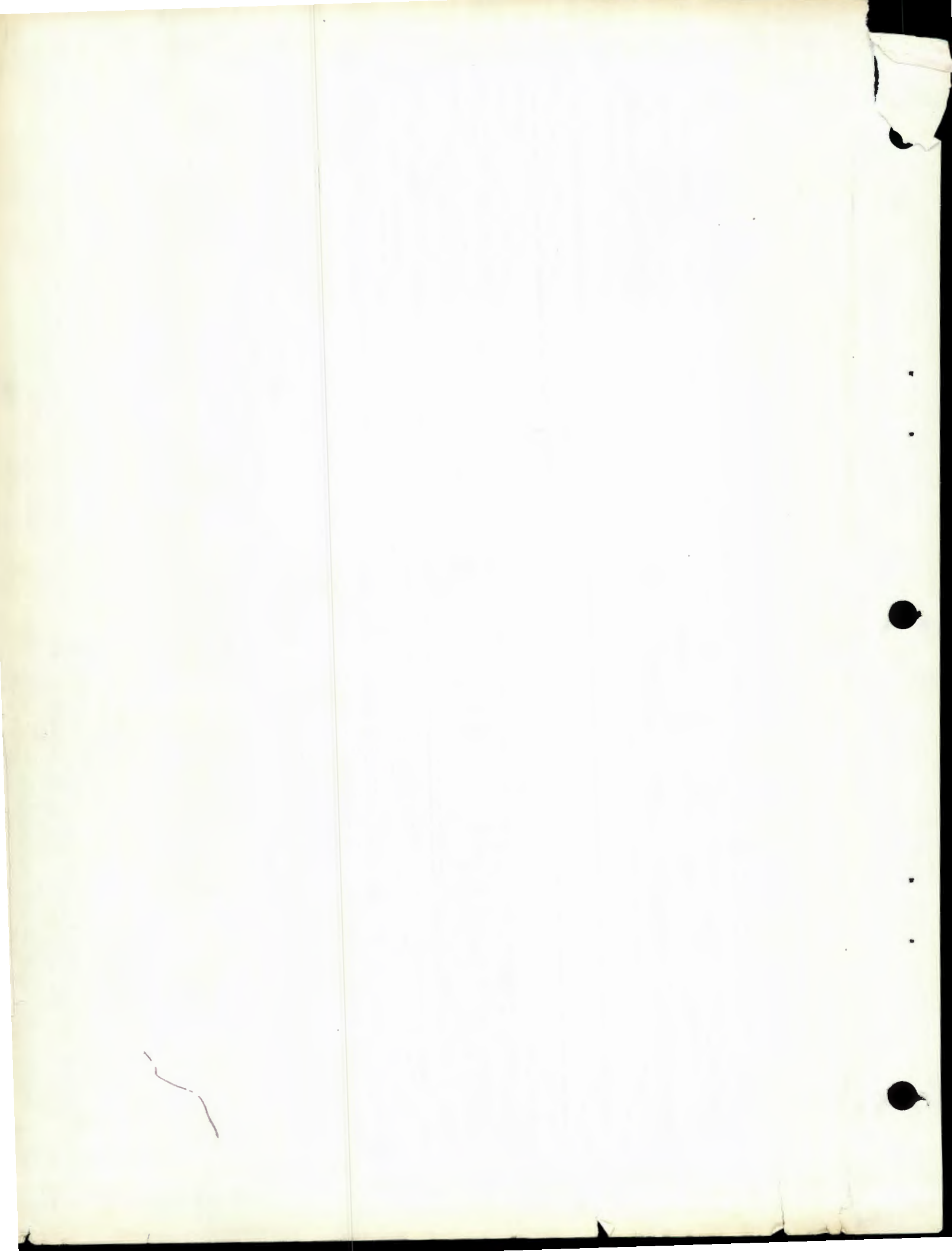
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THE DEPARTMENT OF THE NAVY  
AUTOMATIC DATA PROCESSING PROGRAM  
AS INFLUENCED BY  
GOVERNMENT-WIDE MANAGEMENT POLICIES

By

Edwin John Sabec



THE DEPARTMENT OF THE NAVY  
AUTOMATIC DATA PROCFSSING PROGRAM  
AS INFLUFNCED BY GOVERNMENT-WIDE MANAGEMENT POLICIES

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A Thesis Submitted to the School of Government and  
Business Administration of the George Washington  
University in Partial Fulfillment of the  
Requirements for the Degree of Master  
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April 26, 1968

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## INTRODUCTION

The Federal Government has long been a leader in the field of automatic data processing, and is today the world's largest user of computers. The volume and complexity of the information processed by these computers are awesome. It would be physically impossible in this day and age to carry out many Federal programs without electronic data processing equipment. Unlike the Industrial Revolution or other technological advances, the growth and use of the computer in automatic data processing systems have encompassed only a relatively short period of time. The rapid growth can be attributed primarily to the learning process which has taken place since the early 1950's. Early application of the computer was almost exclusively oriented toward scientific utilization. It was soon discovered, however, that the equipment could also be used as a tool of business management. As a result, a whole new series of developments in equipment and systems design followed, making it possible to adapt electronic data processing systems to office routines. These advances enabled people to do things not previously possible or practicable and the potential for cost savings was tremendous. It is not surprising therefore, that Federal agencies seized upon the opportunity to utilize the computer and its related systems to accomplish their tasks.



As the amount of automatic data processing equipment increased, so did the costs associated with it grow. Quite appropriately, these rising costs have concerned both the Executive and the Legislative Branches of the Government. The increased numbers and the increasing costs associated with data processing systems also created many management problems. These problems became increasingly apparent and dictated the establishment of some sort of coordination on a Government-wide basis.

After numerous studies, investigations and hearings by both Branches of the Government, the year 1965 brought about some corrective measures. Positive action was initiated which was aimed at establishing congruence in the management of automatic data processing in the Government. In that year, the Bureau of the Budget submitted a comprehensive report along with recommendations for corrective measures in the management of automatic data processing. In October 1965, Public Law 89-306 was enacted which was the first legislation directed specifically toward management of automatic data processing.

This paper investigates the effects the legislation and associated policy guidelines have had on the Department of the Navy's Automatic Data Processing Program and, to what extent the Navy is carrying out the basic purpose of Public Law 89-306.

The research leading to this paper consisted of an examination of the Government documents relating to the

management of automatic data processing, various articles written concerning data processing, and personal interviews with personnel associated with the Navy Department's Automatic Data Processing Program.

Chapter I reviews the development and growth of data processing, the associated management problems and the attempts to solve these problems.

Chapter II discusses the Government-wide automatic data processing management policies and the results of these policies.

Chapter III reviews the Automatic Data Processing Program of the Department of the Navy and the recent changes that have taken place.

Chapter IV presents a brief summary of the report and the conclusions drawn.

## CHAPTER I

### GOVERNMENT-WIDE AUTOMATIC DATA PROCESSING PROBLEMS

#### Rapid Growth and Associated Problems

Growth of automatic data processing.--The development of computers and computer technology is considered to be one of the three most significant technological developments within the last two decades. Achievement of the other two developments, peaceful applications of nuclear energy and conquest of space, would probably have been improbable if not impossible, without the evolution of the computer and the related technology.<sup>1</sup>

The Federal Government, as the largest single user of computers, has been a forerunner in the development and utilization of electronic data processing systems. The phenomenal growth in the development and use of these systems has been rapid and is related in great measure to extensive research efforts undertaken in the past in connection with military applications of electronic devices.

Spurred on by needs of the military and other programs of a scientific and research nature, electronic equipment was developed which in turn stimulated the design of equipment for

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<sup>1</sup>Carl W. Clewlow, "Data Processing in the Federal Government", The Federal Accountant, XIV (Summer 1965), p. 35.



use in business type operations. Important technological developments have followed both in the development of equipment and in methods of applying the equipment to business type activities in both Government and industry. The significant changes that are taking place present a severe challenge to management with regard to planning, organizing, and managing to make the most of this new technology. Perhaps the most awesome aspect of this whole evolution is that it has taken place within the past twenty years.

In 1950 there were only two Government computer installations, in 1960 there were 531 and by 30 June 1966, there were over 2600 in use.<sup>1</sup> These figures do not include the specialized computers used by the Defense Department for military and other classified projects. Also, not included are those computers used on Government work by contractors which are being supported, in part or in whole, by cost reimbursement type contracts. In fiscal year 1964, it was estimated that the total computer population employed by or for Government uses totaled approximately 6,000 and accounted for an annual expenditure of nearly \$3 billion.<sup>2</sup> Exhibit 1 presents a graphic display of the accelerated growth in the number of computers in the Federal Government.

Coincidental with the growth in numbers of computers in use, the costs associated with this growth were growing at an

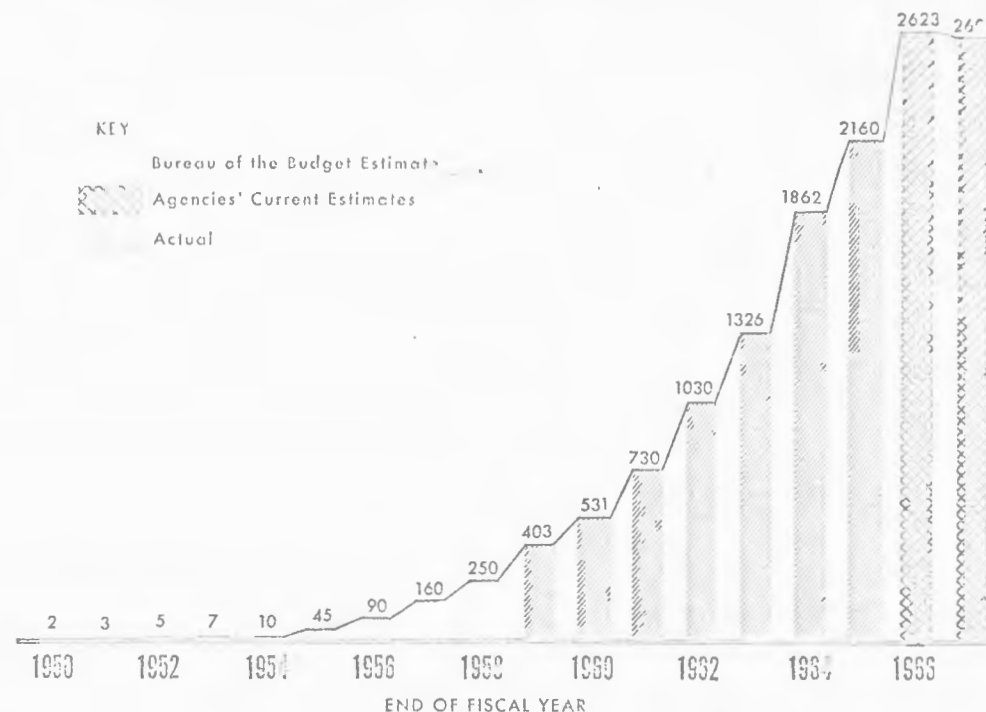
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<sup>1</sup>United States Bureau of the Budget, 1966 Inventory of Automatic Data Processing (ADP) Equipment in the Federal Government (Washington: Government Printing Office, 1966) p. 7.

<sup>2</sup>Clewlrow, op. cit., p. 37.



CHART 1  
Growth in Number of Computers  
in the Federal Government



The sustained growth of computers in the Federal Government reflects the continual blending of this tool into the Federal management process. Also, the conversion of data processing and computational services formerly performed by punch cards into the computer technology is demonstrated by the decline in punch cards and the increase in the number of ADP units using computers.

For the first time, this inventory has recognized the concept established in the *Report to the President on the Management of Automatic Data Processing in the Federal Government*. Chapter 1 discusses the need for a "classification system which recognizes the essential differences among computer installations." Not included in the inventory summary, but included in Table 5, are those computers which are integral to the function of broader technological

systems such as process control, communications control, etc. For this latter category of computers it is difficult to develop complete cost and utilization data independent of the total process with which the computer serves.

Projections for 1967 recognize (a) planned closing of a number of defense installations, and (b) the anticipated impact of the "time-shared" central computer which will provide computational services to a large number of users from one central location, thereby eliminating a number of smaller individual computers. The extent to which the agencies' estimates are valid for fiscal year 1967 is dependent upon whether these plans materialize on schedule and upon the ability of the technology to achieve its announced objectives.

Source: Inventory of Automatic Data Processing Equipment in the Federal Government, Bureau of the Budget, July, 1966.

ever increasing rate also. Exhibit 2 presents the growth of these costs graphically. It is interesting to note that costs for computer units in fiscal year 1966 were nearly triple the costs experienced in fiscal year 1960.

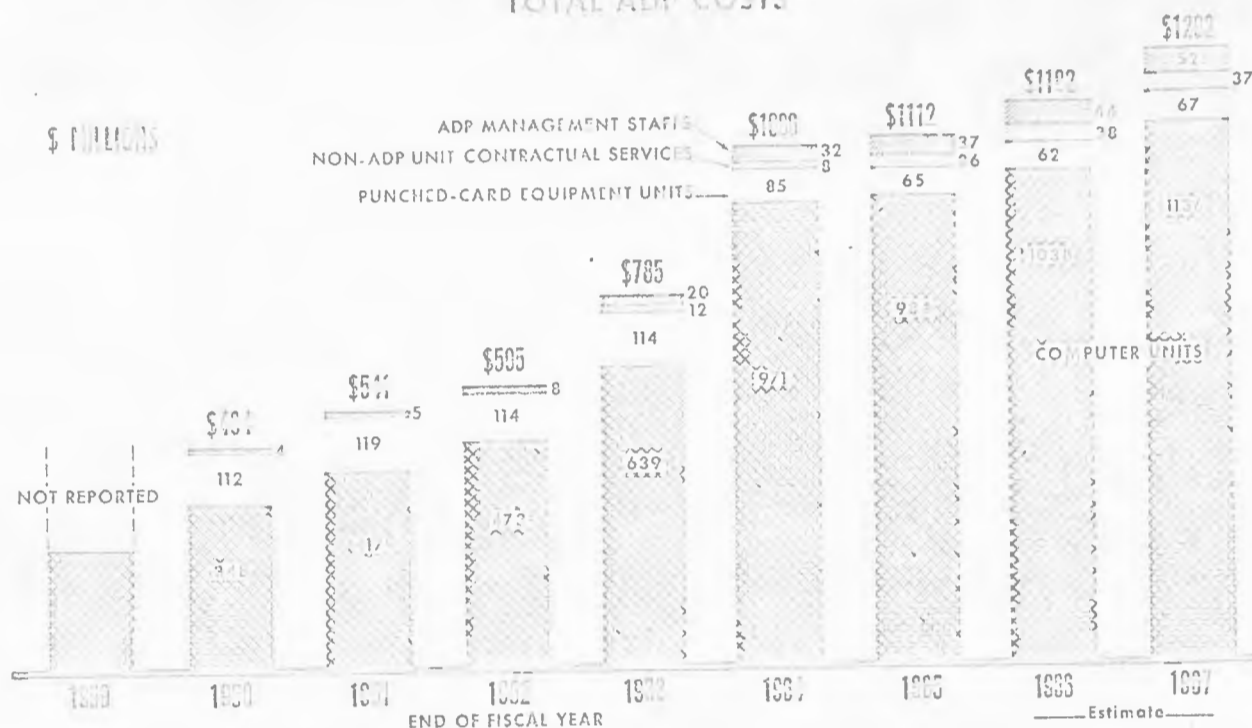
The Department of Defense accounted for 63% or \$742 million of the Federal Government's total FDP costs in fiscal year 1966. Of the Defense Department's total costs, the Navy's share was \$165 million or nearly 14% of the total FDP costs of the Federal Government. During fiscal year 1967, it has been estimated that Defense Department costs totaled \$865 million while the Navy's portion was nearly \$250 million. Of significance is the fact that about 18% of the Federal Government's computers are under Navy cognizance.<sup>1</sup> Exhibit 3 furnishes a breakdown of FDP costs, by Agency, within the Government for fiscal year 1966.

The rapid rate of growth can be ascribed to the fact that all agencies were attempting to acquire, as quickly as possible, computers for their own use. With increasing emphasis being placed on economy and efficiency, it is no small wonder that each agency hurried to install FDP equipment wherever it could be utilized. A new technology was emerging which offered great promises and the greatest of these were personnel savings and other economic factors. The pressure to economize encouraged

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<sup>1</sup>Capt. Arthur K. Bennett, Jr. USN, Director, Office of Information Systems Planning and Development, Presentation to the Navy Graduate Financial Management Class, The George Washington University, December 6, 1967.

# TOTAL ADP COSTS



ADP costs will total an estimated \$1,182 million in fiscal year 1966, an increase of \$70 million over the previous year. Costs for fiscal year 1967 are estimated at \$1,292 million. The cost increases result primarily from the continued growth in the number of computers and ADP organizations. The composition and trends of the costs for computer units are shown in Chart 8.

The costs of ADP units include the salaries of personnel, equipment rentals, supplies, contractual services, equipment purchase and maintenance and site preparation. Added to these costs are the costs of ADP contractual services procured either from Government or commercial sources by organizations not having ADP units of their own, and the salary costs of ADP management staffs that are not directly associated with a specific ADP unit.

Source: Inventory of Automatic Data Processing Equipment in the Federal Government, Bureau of the Budget, July, 1966.

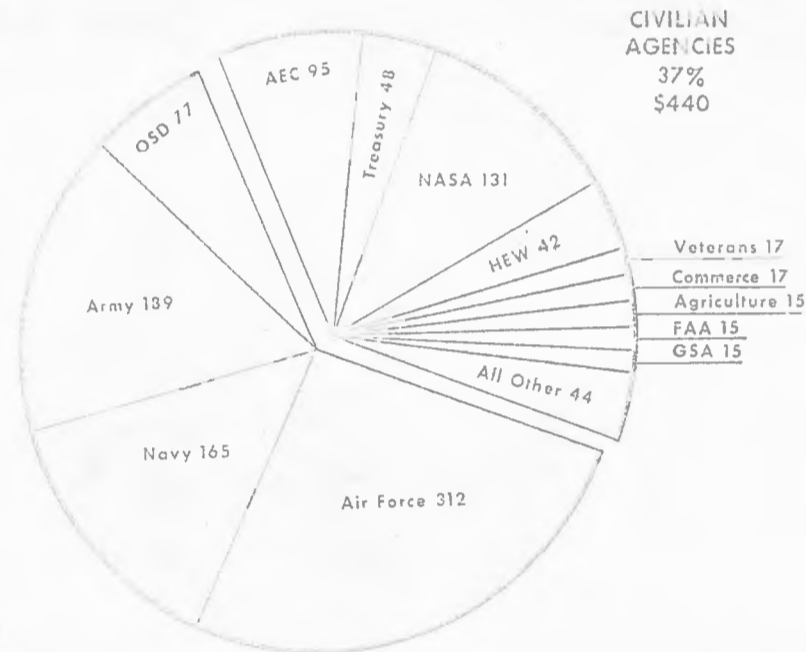


CHART 5  
Distribution of Total ADP Costs by Agency  
Fiscal Year 1966

\$ MILLIONS

DEPARTMENT OF DEFENSE  
63%  
\$742

TOTAL COSTS \$1182



63% (\$742 million) of the Federal Government's ADP costs totaling \$1,182 million are incurred by the Department of Defense. The National Aeronautics and Space Administration and the

Atomic Energy Commission, the next largest users of ADP equipment, incur costs of \$131 million and \$95 million respectively.

Source: Inventory of Automatic Data Processing Equipment in the Federal Government, Bureau of the Budget, July, 1966.

Exhibit 3

each agency to procure and utilize equipment as quickly as possible and hence, the rapid acquisition rate throughout the Government.

Management problems intensified by rapid growth.--The computer is essentially a tool, but an extremely unique and versatile one. The purchase price of a computer ranges from several thousand to several million dollars. Cost depends on many factors including size and speed of internal memory; number, speed, and flexibility of input-output units; communications capability; and internal operating flexibility. The same make and model can be used to process payrolls and accounts, keep personnel records, maintain warehouse inventories, do scientific and engineering calculations, serve as a terminal for a communications network, or control the production of an industrial process, to name but a few examples; or handle many combinations of these.

It is the versatility and cost of the computer which have singled it out for management attention; attention that is not normally given to tools. \*

Since the late 1950's, numerous investigative staffs have identified and enumerated many management problems associated with automatic data processing. Some of the prominent problems which have been identified and for which some positive corrective action has been initiated are listed below:

1. Inadequate systems analysis and design.

2. The automatic data processing information system does not provide the current, comprehensive and accurate information required for sound Government-wide management decisions.

3. Inadequate procedures for the exchange of data processing information, both within and between, the various departments and agencies. This inadequacy has promoted duplicity of efforts and has created strains on financial and manpower resources.

4. Selection and acquisition procedures for both hardware and software have been inefficient.

5. Lack of standardization has made exchange of information between systems expensive in both time and money.

6. Lack of acceptable criteria with which to appraise the effectiveness of the various systems and installations.

7. Poor utilization of both Government owned and Government owned contractor operated automatic data processing equipment which has resulted in excessive costs to the Federal Government.<sup>1</sup>

One of the major issues, which has encompassed all of these management problems, has been the degree of centralized control required to manage most effectively and efficiently the Government automatic data processing program.

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<sup>1</sup>U. S. Bureau of the Budget, Report to the President on the Management of Automatic Data Processing in the Federal Government, March 1965, pp. 5-7.



Efforts to Develop Effective Automatic Data Processing  
Management Policies

The participants.--With the rapid growth and ever increasing expenditures, it became readily apparent that concentrated efforts should be focused on establishing some effective Government-wide policies regarding acquisition and management of the automatic data processing program. Numerous attempts have been made to develop these policies. The principal participants have been the Congress, General Accounting Office (GAO), the Bureau of the Budget, the General Services Administration, the Civil Service Commission and also the National Bureau of Standards. Although some of the participants had different ideas as to what was needed, there was universal agreement that positive action was required.

The Congress.--The two committees of Congress that concerned themselves with the problems of automatic data processing in the Federal Government were the Committees on Government Operations and Post Office and Civil Service in the House of Representatives. The Senate Committee on Government Operations also showed interest in the problems associated with the new technology.

In 1963, Congressman Jack Brooks of Texas introduced H. R. 5171 which was to amend Title I of the Federal Property and Administrative Services Act of 1949. This bill provided for enlarging the authority of the Administrator of the General Services Administration with respect to the acquisition,

maintenance, operation and utilization of automatic data processing equipment by Federal departments and agencies. Specifically, the major provisions of the bill were:

1. GSA would be responsible for providing automatic data processing equipment suitable for effective and efficient use by Federal agencies.

2. GSA would be authorized to direct joint utilization of equipment by two or more Federal agencies and to establish data processing centers.

3. GSA would be authorized to establish equipment pools and transfer automatic data processing equipment from one agency to another.

4. A revolving fund would be established for the procurement, through lease or purchase, of EDP equipment and all expenses associated therewith.<sup>1</sup>

A similar bill, S. 1577, was introduced in the Senate by Senator Douglas at about the same time. While H. R. 5171 was passed by the House of Representatives, after minor amendments, neither bill was passed by the Senate.

The provisions of H. R. 5171 were opposed by almost every Federal department and agency. Those agencies that did not openly oppose the bill requested that they be "specifically excepted" from its provisions. Grave concern was expressed over

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<sup>1</sup>U. S. Congress, House of Representatives, Committee on Government Operations, Economic and Efficient Use of Automatic Data Processing Equipment, Hearings before Subcommittee, 88th Congress, 1st Session, on H. R. 5171, 28 May 1963, pp. 3-4.



turning over control of FDP technology to the GSA, the Federal housekeeper.<sup>1</sup>

The rapid passage of the bill by the House despite agency objections and in spite of the fact that the GSA was the only agency to testify on the bill was viewed by some elements as an over-reaction to an earnest concern over economy and efficiency.

Realizing that FDP would have a serious impact on the Federal worker, the House Committee on Post Office and Civil Service conducted one of the first hearings on FDP in 1960. The hearings were on the subject of "Office Automation and Employee Job Security". The Committee's Report on the Use of Electronic Data Processing Equipment in the Federal Government in 1960 made twenty one recommendations to the Federal agencies on the management and use of FDP equipment, of which seven were related to personnel engaged in FDP operations.<sup>2</sup>

The same Committee conducted comprehensive public hearings in 1962 and 1963. The results of these hearings were published in October 1963 as House Report Number 858, Use of Electronic Data Processing Equipment in the Federal Government, and furnished the following conclusions in five general areas:

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<sup>1</sup>U. S. Congress, House of Representatives, Committee on Post Office and Civil Service, Use of Data Processing in the Federal Government, 88th Congress, 1st Session, 1963, Document No. 858, p. 13.

<sup>2</sup>Ibid., p. 2.

## ORGANIZATION AND MANAGEMENT

Federal department and agency organizational arrangements for FDP systems are not universally adequate or suitable to the tasks to be performed and the problems to be solved. Selected aspects of management and the associated functions of control, coordination, and emergency planning are also in need of improvement.

## MACHINE TECHNOLOGY AND PEOPLE

Machine technology has progressed beyond the ability of people to use it. The technological gap should be closed by giving increased recognition to the people in the EDP system, by increased attention of top management to EDP matters, and by acceleration of programming development.

The principal problem of staffing FDP systems is in the area of programmers. There is a lack of communication as to the seriousness of this problem. The sources of supply are insufficient to the needs, and new and improved sources should be developed.

Problems may become aggravated in the area of recruiting engineering maintenance personnel, and action should be taken to anticipate them. There is a need, also, to improve the working conditions of employees on extra-hour shifts.

While Federal Government agencies have demonstrated considerable ability to control adverse effects of FDP automation on employees, the future is not assured. Therefore, there should be no letdown in existing efforts to reduce EDP's impact on Government employees, and additional constructive actions should be taken.

## REPORTS, STATISTICS, AND EVALUATION GUIDES

A comprehensive statistical reporting system covering electronic data processing systems activities of the Federal Government does not exist and should be established. The system should include a means of evaluating FDP systems accomplishments for individual departments and agencies and for the Government as a whole.

## PURCHASE VERSUS LEASE, INCLUDING OTHER PROCUREMENT PROBLEMS

There are widespread differences of opinion as to whether it is advantageous to purchase or lease FDP systems, and



the causes of the dilemma should be determined. Meanwhile, complete objectivity should be practiced and the best of judgment exercised in making evaluations and in arriving at EDP purchase versus lease decisions. The interests of the Federal Government as a whole should be considered.

EDP systems, by custom, are procured via negotiated contracts and a limited number of plans. A more competitive system and new plans of procurement should be explored.

#### STANDARDIZATION OF ELECTRONIC DATA SYSTEMS

Standardization of EDP systems is vital to the efficient and expeditious use of the systems by the Federal Government, and a serious need exists for a dynamic standardization program.<sup>1</sup>

The conclusions reached by the committee's findings were reinforced with forty-eight recommendations for corrective action toward improved EDP management and operations.

The General Accounting Office.--As the watchdog of Congress with respect to the expenditure of public funds, the General Accounting Office was quite assiduous in bringing to the fore inefficiencies and poor management practices by all arms of the Government in EDP operations. During the period 1958 through 1964, more than 100 audit reports outlining deficiencies in the management of EDP equipment were submitted to Congress and to Federal agencies.<sup>2</sup> The major deficiencies cited in these reports have been:

- (a) Inadequate feasibility studies.
- (b) Uneconomical and ineffective equipment utilization.
- (c) Overpayments resulting from inadequate management practices.

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<sup>1</sup>Ibid., pp. 4-9.

<sup>2</sup>U. S. Congress, House of Representatives, Committee on Government Operations, Automatic Data Processing Equipment, 89th Congress, 1st Session, 1965, Document No. 802, p. 17.

(d) Uneconomical procurement of equipment.

These reports demonstrated that guidelines of an advisory nature and without provisions for effective review or "feedback" of information as to agencies' compliance or the need for policy changes do not meet the Government's ADP management needs.<sup>1</sup>

In addition to the detailed audit reports cited above, five comprehensive overall reports were submitted to Congress in 1958, 1960, 1963, 1964 and 1965.

The first report, Survey of Progress and Trend of Development and Use of ADP in Business and Management Control Systems of the Federal Government as of December 1957, emphasized the need for the Federal Government to establish a program that would provide a mechanism for central coordination which would promote the continuing development of integrated agency systems.

The 1960 report, Review of ADP Developments in the Federal Government, again emphasized the need for more central planning of a long range nature within the executive branch of the Government to maximize efficiency and economy in the administration and management of ADP facilities. This report also suggested the establishment of a Federal program to coordinate procurement and transfer of ADP equipment between agencies to keep costs low. It was further suggested that more consideration be given to purchasing rather than leasing ADP equipment,

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<sup>1</sup>Ibid., p. 17.



especially in those instances where savings could be demonstrated over a period of several years.

In March 1963, the report, Study of Financial Advantages of Purchasing over Leasing of FDP Equipment in the Federal Government, stressed purchasing equipment in order to realize greater economic benefits. The report pointed out that decisions as to financial advantages of purchasing would have to be made ~~from~~ from the standpoint of the Government as a whole rather than just from the standpoint of individual agencies as had been the case in the past. A recommendation was made to establish a central management office in the Executive Branch~~x~~ to ensure maximum utilization of equipment acquired.

The 1964 report, Review of Problems Relating to Management and Administration of FDP Systems in the Federal Government, again stressed the need for centralized management to achieve better acquisition, utilization and management policies.

The 1965 report, Management of ADP Facilities in the Federal Government, contained a review and critical analysis of the 1965 Bureau of the Budget Report to the President. The GAO report stressed the need for a much more centralized management control than was advocated by the Bureau of the Budget.

The Bureau of the Budget.--In keeping with its responsibilities for advising on matters of Government organization and management improvement, the Bureau of the Budget has been

quite active in researching the automatic data processing management problems and developing policy guidance within the Federal Government. Two comprehensive studies were conducted and promulgated in 1959 and 1965. These studies and the recommendations contained therein have been valuable in focusing on deficiencies and the need for attention in this broad and growing area.

In response to the 1958 General Accounting Office recommendation for a coordinated joint program in automatic data processing, the Bureau of the Budget undertook a special study to establish a clearer definition of central agency responsibilities. The completed Automatic Data Processing (ADP) Responsibilities Study was published in 1959. This report recommended the establishment of an ADP program for the Federal Government in which the Bureau would provide leadership in the following manner:

1. Using established lines of communication, existing organizational relationships, and its membership on the Policy Committee for the Joint Financial Management Improvement Program and other such groups to insure effective internal and Government-wide coordination of the ADP program with related programs and activities.
2. Formulating and promulgating policy, criteria, and planning guidance for the ADP program of the Government.
3. Planning and coordinating the implementation of Government-wide ADP orientation and training.
4. Establishing Government formulas for costing ADP applications and reviewing and analyzing summary cost data in terms of dollars and of manpower utilization. \* \*
5. Fostering, promoting, and coordinating the inter-agency sharing of ADP equipment.



6. Developing specific plans for an experimental computer service center and, if deemed feasible, taking action to assure the creation and operation of the same.

7. Coordinating ADP research and development programs of the Government.

8. Providing leadership in a Government-wide effort to alleviate the problems of compatibility of ADP equipment.

9. Fostering and promoting studies which will lead to minimizing the vulnerability of ADP equipment to sabotage, enemy attack, or natural disaster.

10. Operating a Government-wide ADP Information Exchange.

11. Sponsoring the continuation of the Interagency Committee on ADP and assuring its effective utilization.

12. Reviewing and assessing progress of ADP programs in selected agencies and for the Government as a whole.

13. Fostering and promoting desirable standardization in ADP systems which are common to all agencies.

14. Using existing information sources and obtaining such additional summary information as may be essential to the effective performance of the responsibilities assigned.<sup>1</sup>

The recommendations led to the establishment of a new organizational unit in the Bureau to carry out its responsibility of central leadership of the ADP program. Both the General Accounting Office and the Congress favored this central management. This new organizational unit initiated policy guidelines on ADP management which will be discussed later.

Use of Electronic Data Processing in the Federal Government published in 1963 by the House Committee on Post Office and Civil Service prompted the President to direct the Bureau of the Budget to conduct another comprehensive study of the management

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<sup>1</sup>House Committee on Government Operations, Automatic Data Processing Equipment, p. 14.

of ADP activities in the Executive Branch and to furnish recommendations for the required administrative or legislative actions as found to be required or appropriate.

In December of 1963, the Director of the Bureau of the Budget announced the beginning of the study. Top level personnel from the Congress, within the Government, private industry and the academic world participated in the study. The group completed its work over a year later. The report acknowledged the fact that the rapid exploitation of the computer which had been evidenced in the Federal Government had not been without problems involving almost every aspect of acquisition and utilization. The following examples illustrate the problems which they cited.

The diversity of ADP equipment and its use under varying circumstances has raised questions as to the appropriateness of general policies and guidelines applied uniformly to all ADP activities. X

The great range of possible computer uses--that is, the data processing problems to which the computer may be applied--makes it necessary to develop means for selecting those applications which offer the greatest return. Some applications produce distinct advantages while others are marginal at best. \*\*

The tremendous effect of system design on the efficiency and effectiveness of computer applications makes it desirable that means be developed for assuring that techniques of high quality systems design are utilized. \*

The selection of equipment requires extensive knowledge of the use for which the equipment is intended and of the performance of available machines. In making the selection, procedures are needed that are not overly expensive, lead to the right choice, and encourage competition. \*  
\*  
\*



The high cost of computers requires that, wherever feasible, machines already available within the Government be utilized in lieu of acquiring additional capacity . . .

Contracting for computers is made difficult by the lack of standard characteristics of the equipment, the more or less intangible nature of supporting services that are required, and the need for timeliness in the issuance of contracts.

Decisions on rental versus purchase involve problems of predicting the economically useful life of equipment under conditions of changing requirements and technology as a basis for determining whether the costs associated with leasing will exceed the costs associated with purchase.

The disposal of excess and surplus machines creates problems that will grow as the Government increases its equipment purchases. The problems involve questions of timing, responsibility for choosing the best means by which agencies may accomplish their missions and economic obsolescence.

Maintenance of equipment is a relatively new problem. Rented equipment is ordinarily maintained by the manufacturers. For purchased equipment, policies must be developed for choosing between commercial maintenance procedures and maintenance by Government employees.

The differences among electronic data processing equipment make the transfer of data among machines and systems difficult and expensive. As in most expanding technologies, there are problems of providing the resources for, and of achieving, a satisfactory degree of universally accepted standardization without inhibiting advances in the state of the art.

There is a need for coordinating research and disseminating findings . . .

The way in which contractors, performing work for the Government, acquire and use computers is important because there are indications that the amount of work done for the Government on contractor's computers is large. Problems in assuring efficient and economical use, particularly by contractors who are working on a

cost-reimbursement basis, have risen because of the need for avoiding the usurpation by the Government of the management responsibilities and authorities of the contractor and also for avoiding procedures that would result in the Government's acquiring expensive equipment that would rapidly become obsolete.<sup>1</sup>

It would appear that several additional problems should have been cited also: (1) an information system which would provide the current, comprehensive, and accurate information necessary for sound management decisions is lacking; (2) criteria with which to appraise the effectiveness of the various systems and installations are non-existent; and (3) the current procedures for acquiring hardware and software are inefficient.

Accordingly, the following summarized recommendations were made which outlined actions to be undertaken to bring about successful resolution of current and future problems occasioned by the use of the computer in the Federal Government:

1. Modify existing Government-wide policies so that their precise application in different kinds of operating situations is more closely defined.
2. Develop and furnish criteria to assist agencies in evaluating whether computers are being used effectively.
3. Develop and furnish cost principles to be applied uniformly by agencies when computers and related services are shared with others on a reimbursable basis.

4. Expand existing policies for the selection of equipment to provide additional guidelines on (a) the preparation of systems specifications which are transmitted to suppliers when inviting proposals to furnish equipment, and (b) methods for evaluating suppliers' proposals.

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<sup>1</sup>U. S. Bureau of the Budget, Report to the President on the Management of Automatic Data Processing in the Federal Government, March 1965, pp. 5-7.



5. Continue present policies governing the purchase or rental of computers, except (a) to include the cost of money as a factor in comparing alternative costs, and (b) provide for a general suspension of purchase activity if a review of computer technology indicates that superior equipment will soon be available, or if prospective excesses of Government-owned equipment indicate that additional purchases should not be made. As a consequence of increased purchasing in recent years, policies governing the replacement of equipment to avoid unwarranted long-term use, and the use of alternative ways for maintaining owned equipment will be formulated.

6. Establish a firm time schedule for the negotiation of annual contracts with equipment suppliers, and seek improved contract terms.

7. Strengthen Government support of programs initiated by the American Standards Association to achieve needed compatibility among automatic data processing equipment and systems.

8. Give increased attention to the coordination and evaluation of research and development programs in the field of computer sciences. Expand the resources of the National Bureau of Standards to advance the development of computer technology and systems oriented primarily toward Government needs.

9. Extend Government policies on the purchase or rental of equipment and on the use of excess equipment to contractors who perform work for the Government (primarily Defense, Atomic Energy Commission, and the National Aeronautics and Space Administration) on a cost-reimbursement basis. Include contractor-operated equipment in intra-agency sharing arrangements.

10. Develop and prescribe a Government-wide information system to provide selected managerial levels with information needed to manage computer resources more effectively.

11. Continue present organizational arrangements and general assignments of responsibility among central assignments of responsibility among central and line agencies, but strengthen and augment the resources devoted to the management of automatic data processing activities.

12. Propose the enactment of legislation by the Congress which would (a) constitute an expression of congressional policy and interest with respect to effective and economical use of automatic data processing equipment, and (b) strengthen the authorities for the development, testing, and implementation of standards; the performance of research in computer sciences and the provision of advisory services by the National Bureau of Standards; and the establishment of a revolving fund to finance arrangements for the joint utilization of computer facilities.<sup>1</sup>

Although six years had elapsed since the 1959 study, most of the recommendations proposed by that study were again repeated in the present report. The "dynamic leadership" espoused by the 1959 study never came about, so consequently, the management concepts cited never came about. The earlier study was strong and clear as to what had to be done, but relatively weak and ineffective as to how to do it. Although recognition was made of the fact that legislation might be necessary, this aspect was not emphasized.<sup>2</sup>

In conjunction with the studies and reports of the General Accounting Office, the Bureau of the Budget issued various policy documents during the period 1959 through 1965. The first of these, Bulletin 60-6 entitled Guidelines for Studies to Precede the Acquisition of Automatic Data Processing Equipment was issued in 1960. This document provided evaluation procedures to be followed by agencies in conduction feasibility studies; however, it was only advisory and had no obligatory requirements.

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<sup>1</sup>Ibid., pp. 11-13.

<sup>2</sup>House Committee on Government Operations, Automatic Data Processing Equipment, p. 16.



In 1961, Circular A-54, Policies on Selection and Acquisition of Automatic Data Processing (ADP) Equipment was promulgated. The principal factors discussed in this circular were:

1. The desirability of selecting on the basis of exact system specifications.
2. That equal opportunity and appropriate consideration should be afforded all manufacturers who offer equipment capable of meeting systems specifications.
3. That two primary factors should be considered in the selection of equipment:
  - (a) its capability to fulfill system specifications, and
  - (b) its overall costs.
4. The need for effective lease versus purchase evaluations.<sup>1</sup>

This circular has proved to be valuable in creating an objectivity in the procurement evaluation of equipment.

Circular A-55, Annual Reports on the Utilization of Automatic Data Processing Equipment in the Executive Branch, published in 1963, prescribed the formats of the reports on computer installations including costs, personnel, utilization and applications which the agencies submitted. These reports were the basis of the annual Inventory of Automatic Data Processing Equipment in the Federal Government which is prepared by the Bureau of the Budget. In 1963 another guideline, Circular A-61, Guidelines for Appraising Agency Practices in Federal Agencies was published. While containing much of the

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<sup>1</sup>Ibid., p. 17.

same information published in preceding circulars and bulletins, this circular was directed toward top management personnel. Its objective was to provide these top level managers with guidelines to assist in organizing and evaluating performance of automatic data processing equipment under their cognizance.

In 1964, Circular A-27, Policies and Responsibilities on the Sharing of Electronic Computer Time and Services in the Executive Branch, encouraged maximum utilization of the General Services Administration's Computer Sharing Exchanges and the National Bureau of Standard's Computer Service Center.

The General Services Administration.--The General Services Administration had been primarily active in the area of automatic data processing acquisition. Beginning in 1955, it negotiated Government-wide Federal Supply Schedule contracts with manufacturers. These negotiations covered basic rental periods and other conditions which have resulted in terms more favorable to the Government. Performance standards and provisions for damage claims were also established.

In 1964, the General Services Administration Personal Property Management Regulation No. 36, Utilization of Screening of Government-Owned and Leased Electronic Data Processing Equipment, was promulgated. This regulation provided for agencies to report excess equipment available and to consider utilization of such equipment prior to purchasing or renting additional equipment.



Additionally, the General Services Administration established regional sharing exchanges throughout the country to promote more effective utilization of computer resources as provided for by Bureau of the Budget Circular A-27.

Civil Service Commission.--The Civil Service Commission became active in solving personnel problems evolving out of the growth of automatic data processing in the Federal Government. The Commission established useful classifications and qualification standards for computer occupations. Comprehensive training programs were established to prepare personnel in the uses of computers and their application. Management training courses were established to help managers and key officials make the most out of computer applications.

The commission ambitiously conducted programs to retrain and/or relocate Government employees who were displaced by automatic data processing systems.

The National Bureau of Standards.--This activity participated in the computer evolution by providing assistance to Government agencies with regard to systems design, programming and equipment selection. A Computer Service Center and Sharing Exchange is operated for the Washington area. Additionally, experimental work in computer design and operation has made contributions toward more effective use of FDPE.

#### Summary

In spite of the efforts of the various Federal activities, the management problems associated with the rapid growth

of automatic data processing continued to grow.

In the 1959 Responsibilities Study, the Bureau of the Budget recognized the need for specialized management of ADP, for Government-wide coordination and the fundamental importance of up-to-date information for all levels of management.<sup>1</sup> Without clear cut delineation of responsibilities and authority, however, the coordination so desperately required would not be possible. The 1965 Report to the President recommendations concerning legislative action were an attempt to furnish statutory policy concerning the administration and management of the Government's automatic data processing program.

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<sup>1</sup>Ibid., p. 14.



## CHAPTER II

### FORMULATION OF GOVERNMENT-WIDE MANAGEMENT PRINCIPLES

#### The Assignment of Authority and Responsibility

The events of 1965.--The year 1965 was prominent in that it marked the beginning of a new era in Government automatic data processing management. Two significant advances were made which were directly related to the 1965 Report to the President. Specific areas of responsibility were assigned to the Bureau of the Budget, the General Services Administration, the National Bureau of Standards and the Civil Service Administration. The basic guidelines for these assignments were contained in two documents; Bureau of the Budget Circular No. A-71, Responsibilities for the Administration and Management of Automatic Data Processing, and Public Law 89-306.

Circular A-71.--The Bureau of the Budget, as the principal staff arm of the President, attempted over the years to carry out its responsibilities of developing improved plans of administrative management and of advising the executive departments and agencies of improved management practices in the field of automatic data processing. This responsibility had been vested in the Bureau by the Budget and Accounting Act.<sup>1</sup>

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<sup>1</sup>U. S. Bureau of the Budget, The Bureau of the Budget--What it is--What it does, June 1965, p. 5.

Early policy guidance with regard to automatic data processing, however, was generally advisory and permissive with respect to compliance. This permitted agency avoidance or limited compliance, so consequently the desired results were limited in scope.<sup>1</sup>

Circular A-71 was issued in March 1965, shortly after the Report to the President was published. This circular identified certain responsibilities of executive agencies regarding management and administration of automatic data processing and was intended to provide maximum coordination among the staff and operating agencies of the executive branch.

Specific responsibilities assigned to the various executive agencies were as follows:

BUREAU OF THE BUDGET: The Bureau of the Budget will provide overall leadership and coordination of executive branch-wide activities pertaining to the management of automatic data processing equipment and related resources and will develop programs and issue instructions for achieving increased cost effectiveness through improved practices and techniques for the selection, acquisition and utilization of automatic data processing equipment and resources.

GENERAL SERVICES ADMINISTRATION: The General Services Administration is responsible for aiding in the achievement of increased cost effectiveness in the selection, acquisition

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<sup>1</sup>House Committee on Government Operations, Automatic Data Processing Equipment, p. 24.



and utilization of automatic data processing equipment and appropriate related resources . . .

DEPARTMENT OF COMMERCE: The Department of Commerce is responsible for aiding in the achievement of increased cost effectiveness in the selection, acquisition and utilization of automatic data processing equipment . . .

HEADS OF EXECUTIVE AGENCIES: The heads of all executive departments and establishments are responsible for the administration and management of their automatic data processing activities including:

a. Agency-wide planning, coordination and control of equipment utilization.

b. Determination and use of those equipment applications that offer the greatest return in terms of increased effectiveness in mission accomplishment and higher productivity.

c. Development of data systems that employ the use of the most advanced design techniques.

d. Merger or integration of data systems irrespective of intra-agency or interagency organizational lines, when cost effectiveness in equipment utilization, data systems management, or program accomplishment can be increased.

e. Determination of automatic data processing equipment requirements.

f. Sharing equipment time and services within the agency, and with other agencies through support of the Government-wide program for sharing exchanges; cooperation in the establishment of service centers and other interagency joint use arrangements.

g. Consideration of the potential impact of the introduction of ADP equipment on the agency work force and taking such steps as are necessary to alleviate adverse effects to the greatest extent practicable.

h. Participation in Government-wide studies and programs for improving the administration and management of automatic data processing activities in the executive branch.<sup>1</sup>

Public Law 89-306.--In recent years, Congressional Committees have held extensive hearings and conducted special

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<sup>1</sup>Bureau of the Budget Circular No. A-71, "Responsibilities for the Administration and Management of Automatic Data Processing Activities," March 6, 1965.



investigations on the Government's management of automatic data processing resources. The General Accounting Office had issued over 100 individual audit reports alleging shortcomings in the acquisition and use of ADPE in various departments, agencies and by Government contractors in addition to the four comprehensive reports which concluded that there should be Government-wide coordination in ADP management. The results of these actions in addition to the annual expenditure of \$3 billion for Federal ADP kept Congressional interest high. A result of the many hearings and investigations was H. R. 4845 which became Public Law 89-306 in October 1965. This legislation is popularly referred to as the "Brooks Bill" in recognition of its principal sponsor, Congressman Jack Brooks of Texas.

Public Law 89-306 amended the Federal Property and Administrative Services Act of 1949 by adding a separate section on automatic data processing equipment:

To provide for the economic and efficient purchase, lease, maintenance, operation and utilization of automatic data processing equipment by Federal departments and agencies.<sup>1</sup> X

Specific responsibilities and authorities in these matters were assigned to the General Services Administration, the Department of Commerce and the Bureau of the Budget.

The basic assignments to the various agencies as provided for by this legislation are summarized as follows:

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<sup>1</sup>Public Law 89-306 is reproduced in Appendix A.

Provides the basic authority to be exercised by the General Services Administration.

Authorizes the establishment of a revolving fund to finance the activities of the Administrator of the General Services Administration in pursuance of this authority.

Provides for the administration of the data processing revolving fund.

Prescribes that other provisions of law which are inconsistent with the new data processing services shall not be applicable in administering the new data processing authority therein provided.

Authorizes the Secretary of Commerce to undertake necessary research and provide scientific and technological advisory services relating to the use of automatic data processing in Government.

Provides that the authority conferred shall be exercised subject to direction by the President and policy and fiscal control by the Bureau of the Budget.<sup>1</sup>

The operational role of the General Services Administration covered the procurement, utilization and disposition of automatic data processing equipment. The authorization of the revolving fund gave the agency the ability to operate under the "single purchaser" concept. Also, provision was made to prevent the General Services Administration from interfering with or controlling agency equipment selection or utilization. Separation of the selection and the acquisition functions was established. \* \*

The Department of Commerce, through the National Bureau of Standards, was made responsible for development of data processing standards and for providing agency assistance in designing systems.

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<sup>1</sup>Ibid.



The Bureau of the Budget was formally given responsibility for exercising policy and fiscal control over the government-wide data processing program.

The intent of this legislation was to improve the operational means available to the Government by providing legislation to make it possible for those agencies already possessing data processing management responsibilities to do a better job in the future. Congressional interest was directed toward providing appropriate ways for determining effective policies and accomplishing fiscal control rather than setting explicit policies. The main thrust of the legislation was aimed at coordination, throughout the Government, in management of data processing.<sup>1</sup>

#### Policy Guidance

General Services Administration.--Circular A-71 and Public Law 89-306 assigned responsibilities and provided authority to the responsible executive agencies for the administration and management of automatic data processing activities. Policy guidance was furnished both GSA and the Department of Commerce by the Bureau of the Budget in 1966.

In the initial guidelines set for the GSA on 4 May 1966, the following specific areas were emphasized:

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<sup>1</sup>Robert B. Lewis, "New Statutory Data-Processing Responsibilities," The Federal Accountant, XV (Fall 1965) p. 139.

#### A. ADP Revolving Fund

The ADP revolving fund authorized by Public Law 89-306 shall be used to promote and facilitate the financing of arrangements for the joint use of ADP equipment and related services. GSA will, however, explore various possibilities for enabling agencies to obtain needed data processing equipment and/or services at a reduced cost, which may lead to further uses of the fund . . .

#### B. Review of the ADP Procurement Process

1. GSA will evaluate the procurement processes currently employed by the Federal Government in acquiring data processing equipment or services, to determine the areas in which revised techniques, methods or practices will offer greater efficiency and economy . . .
2. GSA will undertake a program to assist individual Federal agencies in negotiating the procurement of equipment systems support . . .
3. In collaboration with the scientific and technological research and evaluation capabilities of NBS, GSA will develop procurement techniques which would focus on "total system performance" in lieu of product capability . . .

#### C. Redistribution of Excess Equipment

1. Although excess ADP equipment will be used to the maximum extent in meeting legitimate approved agency needs, computers should not be used for work not essential to the agency mission . . .
2. GSA will extend and intensify its program to effect redistribution of excess equipment within the Government (including its cost-type contractors) whenever practicable . . .
3. GSA will retain a continuous review of potential excesses in various categories of Government-owned equipment and will inform agencies when such excesses are sufficiently imminent (a) to be considered in determining the need for soliciting industry or (b) to warrant only the temporary rental of additional equipment until the excess equipment is available for redistribution.

#### D. Source Data Automation

GSA, through the National Archives and Records Service, will continue its program for developing and encouraging the use of source data automation techniques by Government agencies.



## F. Information Systems

Work has been in process in the Bureau of the Budget to develop an information system which will meet the requirements of central agencies . . . GSA will provide full-time staff members to assist in the detailed design of the system, and such personnel as may be required to program, operate, and maintain the system.<sup>1</sup> . . .

Department of Commerce.--Public Law 89-306 authorized the Secretary of Commerce to undertake the necessary research in the sciences and technologies of automatic data processing computers and related systems as may be required, and to provide agencies with scientific and technological advisory services. Responsibility for carrying out these functions was assigned to the Center for Computer Sciences and Technology, an organization within the Institute for Applied Technology, National Bureau of Standards.

In its policy directive, on 15 December 1966, the Bureau of the Budget specified initial guidelines for specific action. These included the following areas: (1) Advisory and consulting services, (2) Development of voluntary commercial standards, (3) Recommendations for uniform Federal standards, (4) Research on computer sciences and techniques and, (5) Operation of a computer service activity to meet not only the needs of the National Bureau of Standards, but also other Federal Agencies when required.<sup>2</sup>

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<sup>1</sup>U. S. Congress, House of Representatives, Committee on Government Operations, Hearings on Data Processing Management in the Federal Government, 90th Congress, 1st Session, July 1967, pp. 203-205.

<sup>2</sup>Ibid., pp. 205-208.

Since the enactment of Public Law 89-306, the Bureau of the Budget has also issued or revised a number of its circulars which enunciate policies and guidelines that apply to all Federal Agencies. Circular A-54 which deals with the selection and acquisition of ADP equipment has, recently, been revised in five important respects. The revision (1) clarifies and reaffirms its application to Government cost reimbursement-type contractors, (2) stipulates that new ADP equipment will not be acquired until all possibilities for sharing existing equipment or utilizing excess equipment are exhausted, (3) cautions agencies to be more specific in stating their requirements for delivery and performance of both hardware and software when executing contracts for equipment, (4) requires the cost of money to be added to the capital investment when comparing costs in deciding whether to buy or lease equipment, and (5) requires displaced equipment to be reported as excess and not retained for other uses unless properly justified.<sup>1</sup>

Top management interest.--A recent article in the Harvard Business Review revealed that top management interest and involvement in computer activities was one of the ingredients inherent in successful corporations.<sup>2</sup> Top management

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<sup>1</sup>U. S. Bureau of the Budget, Policies on selection and acquisition of automatic data processing equipment, Circular A-54. Revised transmittal memorandum No. 1 (June 27, 1967).

<sup>2</sup>Neal J. Dean, "The Computer Comes of Age", Harvard Business Review, (January-February 1968), pp. 83-91.



interest in automatic data processing in the Federal Government was demonstrated when the President favorably endorsed the 1965 Bureau of the Budget Report to the President. On 28 July 1966, the President again voiced a strong interest in this activity when he issued a memorandum to the heads of executive departments and agencies and directed the head of every Federal agency to explore and apply all possible means for (a) using the electronic computer imaginatively to provide better service to the public, improve agency performance and reduce costs, and (b) managing electronic computer activities at the lowest possible cost. The President also directed the Director of the Bureau of the Budget to report to him semiannually on the progress that the Federal Government was making in these respects.<sup>1</sup>

In order to evaluate the progress being made in the attainment of these objectives, the Bureau of the Budget issued Circular A-79, Report of accomplishments in the use and management of automatic data processing (ADP). The reporting requirements set forth the necessary data in order to prepare the semi-annual reports for the President. The first of these reports was submitted to the President in February 1967 and highlighted the significant accomplishments in using computers to improve the conduct of Government operations and efforts made to improve upon the procurement and utilization of this expensive equipment. Some of the significant accomplishments

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<sup>1</sup>Memorandum from the President of the United States, Lyndon B. Johnson, to Heads of Departments and Agencies, June 28, 1966.

reported were:

The redistribution within the Government of equipment valued at \$70 million, thereby avoiding expenditures for new equipment.

A savings of \$26 million by using time available on Government computers at locations other than where the requirement existed, rather than acquiring additional equipment.

Avoidance of approximately \$200 million in annual rental costs by selective purchase of computers, many of which were bought within the past three years and have already been amortized.

Improved terms and conditions of use advantageous to the Government have been negotiated with manufacturers under the Federal Supply Schedule. Additionally, negotiations leading to bulk procurement actions have resulted in substantial savings.

Numerous consolidations of small computer facilities into a lesser number of larger, more powerful facilities have been accomplished with savings in both operating costs and manpower.

The Federal Government is expanding its participation and support of efforts to establish equipment and software standards. Seventeen such standards have been announced so far.

Work is in progress on a program to establish standards in a broad range of data elements and related codes. This is to facilitate the automated exchange and summation of data within the Government, and with industry and the public.<sup>1</sup>

Although the report was extremely favorable in listing the accomplishments achieved and was heralded by the Congress, GAO, GSA, and the Bureau of the Budget, it did conclude: . . .  
"there is much more that can and must be done to:

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<sup>1</sup>House Committee on Government Operations, Hearings on Data Processing Management in the Federal Government, pp. 201-202.



- a. Make computer systems more effective.
- b. Improve further the utilization and methods of procurement.
- c. Achieve greater compatibility among equipment and systems.
- d. Develop appropriate standards of performance.<sup>1"</sup>

#### Centralized Management Information System

Circular A-83.--One of the fundamental weaknesses in the management of ADP in the Government was the lack of complete current information in a central location as to the Government's present equipment, its age, condition, configurations, utilization and future plans.

In order to comply with the recommendations contained in the 1965 Report to the President and the provisions of Public Law 89-306, the Bureau of the Budget in conjunction with the General Services Administration has established an ADP management information system.

In addition to reporting ADP equipment, the system provided for detailed information on punch card equipment and installations. The system will also:

- a. Provide to the Bureau of the Budget, the Department of Commerce, and the General Services Administration timely and comprehensive information to assist these agencies in the discharge of their responsibilities under Public Law 89-306.
- b. Provide assistance to agency heads in the administration and management of their automatic data processing activities.

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<sup>1</sup>Ibid.

c. Provide a comprehensive and perpetual inventory of electronic data processing equipment.

d. Provide integrated subsystems for inventory, utilization, manpower, cost and acquisition history. Additional subsystems concerning selected information on program plans, budget requirements, equipment and software performance, applications, and personnel requirements will be considered for development and subsequent integration into advanced management information system for ADP.<sup>1</sup>

Circular A-83, ADP Management Information System, promulgates the new reporting requirements of the new ADP management information system. All Federal agencies having organization or ADP units which use or plan to use, acquire or plan to acquire, or perform any ADP services, are required to report information to be used as inputs into the new system. Provision has also been made to include ADP equipment used by Government contractors in the performance of cost-reimbursement contracts.

#### Summary

After numerous abortive attempts to bring some semblance of coordination to the management of automatic data processing within the Federal Government, the events of 1965 and subsequent actions have made some progress in this direction.

The 1965 Report to the President epitomized the major problems and made conclusive recommendations as to what actions should be taken to correct the deficiencies noted. Legislation

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<sup>1</sup>U. S. Bureau of the Budget, ADP Management Information System, Circular A-83, April 20, 1967.



in the form of Public Law 89-306 formally recognized the responsibilities assigned by Circular A-71.

Due to the complexity and the vast scope of the entire Federal ADP program, progress has been slow. To date, the principal actions which have been taken to implement the provisions of Circular A-71 and Public Law 89-306 have essentially been limited to: (a) Expansions of the Government-wide ADP Management Reporting System which Circular A-83 provides for; and (b) Extension of the Government-wide equipment reutilization and sharing programs by the General Services Administration. These actions have made some significant contributions toward fulfilling the purpose of the legislation, i. e. provide for the economic and efficient purchase, lease, maintenance, operation and utilization of automatic data processing equipment. ✓

Although some impressive savings and benefits have been reported since the enactment of Public Law 89-306, these are not to be construed to be a signal for relaxation of effort. The technology continues to progress at a rapid rate and will require even more concentration of effort if effective exploitation of the computer's potential is to be realized. Improved management provides a vehicle by which management can utilize and capitalize on the developments being made.

A concentration of effort must be exerted in the areas of standardization and utilization of information available. Progress in both areas has been extremely slow. Continued

emphasis must also be placed on the training of competent personnel in order to develop a professional cadre to coordinate and manage effectively the systems already in existence as well as those in the development stages.



### CHAPTER III

#### THE DEPARTMENT OF THE NAVY AUTOMATIC DATA PROCESSING PROGRAM

##### Direction and Guidance

Department of Defense.--The Department of Defense has led the Federal Government in the application of modern computer technology and techniques in business and scientific management information systems, and in application for other military purposes. Although significant economies and benefits have been realized from the use of these advanced methods and techniques, there has been continuous emphasis on improving and standardizing data systems and for further exploiting this technology.

The Assistant Secretary of Defense (Installations and Logistics) is the principal policy official for automatic data processing matters in the Department of Defense. He is responsible for policies, criteria, and standards governing the selection, acquisition, use, and management of ADPE. He also provides direction on specific application of ADPE to logistics systems throughout the Defense Department. \*

For application of ADPE in scientific and engineering areas, communications, command and control, intelligence and tactical operations, the Director of Defense Research and Engineering provides guidance and active participation in

management purview and development of policies and criteria.

The Assistant Secretary of Defense (Comptroller) is responsible for the development and maintenance of standard data elements and their related machine sensible codes in order to promote compatibility among automated data systems throughout the Department of Defense.<sup>1</sup>

Department of the Navy.--The same Department of Defense Directive that assigned the responsibilities to the Assistant Secretary of Defense (I&L) regarding ADP administration, also directed the Secretaries of the Military Departments to designate a Senior ADP Policy Official to serve as the focal point for ADP policy and for the administration of the ADP program within the military department.

A Secretary of the Navy Instruction<sup>2</sup> has designated the Special Assistant to the Secretary of the Navy (SASN) as the Navy's Senior ADP Policy Official and assigned responsibility for all management information systems, for automatic data processing systems and equipment and for direct supervision of the Office of Management Information (OMI). In carrying out his responsibilities, he issues policies and requires reports concerning acquisition, use, management and

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<sup>1</sup>U. S. Department of Defense, Responsibilities for the Administration of Automatic Data Processing Equipment Program, Directive 5100.40, September 28, 1963, pp. 4-5.

<sup>2</sup>U. S. Department of the Navy, Office of the Secretary, Assignment of Responsibilities to and Among the Civilian Executive Assistants to the Secretary of the Navy, Inst. 5430.7G February 14, 1966, p. 3.



transfer of ADPF; approves computer selections except sole source actions reserved to the Office, Secretary of Defense; data transmission facility requirements and ADP management consultant contracts; and evaluates ADP installations. Staff support for the Senior ADP Policy Official is provided by the Office of Information Systems Planning and Development.<sup>1</sup> This Office has just recently been formed and will be discussed in detail later in this chapter.

The Navy's ADP Program is administered under the centralized policy direction emanating from the Navy ADP Policy Official. The responsibility for assuring compliance with policy and the implementation of all prescribed procedures rests with the Heads of Departmental Components. These operating executives include the Chief of Naval Operations, Commandant of the Marine Corps, Deputy Comptroller of the Navy, Director of Civilian Manpower Management, Chief of Naval Research, Chief of Naval Material, Chief of Naval Personnel, and the Chief of the Bureau of Medicine and Surgery.<sup>2</sup>

#### Organization for Management

General.--On 28 June 1966 the Chief Executive, in a memorandum to Heads of Departments and Agencies, directed

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<sup>1</sup>U. S. Department of the Navy, Office of the Secretary, Office of Information on Systems Planning and Development, Inst. 5430.83, 11 September 1967, p. 1.

<sup>2</sup>U. S. Department of the Navy, Office of the Secretary, Automatic Data Processing Program, Inst. P10462.7B, March 11, 1966, p. II-2.

specific emphasis on the Government's Automatic Data Processing Program. ( This memorandum directed the head of every Federal agency to put priority emphasis on the use of electronic computers in the management of the affairs of government. At the same time, he urged that the Government's computer program be operated most efficiently and at the lowest possible cost.<sup>1</sup>

Following closely behind the President's message, the Secretary of Defense on 29 July 1966 issued a memorandum to the military services directing them not only to concentrate their efforts on the attainment of the President's objectives, but also to provide an example for the rest of the Federal agencies to follow. Specifically, the Secretary of Defense included directions to the military services to:

1. Fully exploit the tremendous capabilities of the computer;
2. Centralize systems design at appropriate levels;
3. Divorce computer evaluation and selection from computer-using organizations; \*
4. Fully test their programs prior to the selection of equipment; and
5. Conduct regular reviews and audits of computer systems development and programming operations.<sup>2</sup>

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<sup>1</sup>Op. cit.

<sup>2</sup>Secretary of Defense Memorandum for Secretaries of the Military Departments and Directors of Defense Agencies, 29 July 1966 (Subject: Management and Use of the Electronic Computer)



The objectives of the Department of the Navy ADP Program may best be expressed in terms of two essential management concerns with ADPE:

1. Management and control of selection, acquisition, and release of equipment itself, and
2. Its application as a means to improve management information systems.<sup>1</sup>

With this in mind, in addition to recognition of the mandates from the President and the Secretary of Defense cited earlier, and the magnitude of the problems which accompany the management of the large resources involved, the Office of Management Information was recently reorganized. Three new Offices have been formed to support the Navy's ADP Policy Official to assure continuing effective management and exploitation of automatic data processing systems. These new Offices are the Office of Management Information, the Office of Information Systems Planning and Development, and the Automatic Data Processing Equipment Selection Office. Exhibit (4) portrays this new organizational change.

Office of Management Information (OMI).--This Office consists of what was formerly the Progress Appraisal Division (PAD) under the old organization. The primary function of this Office is to operate the Secretary of the Navy's Management Information Center (SECNAV MIC). The SECNAV MIC is a center for both oral and visual presentation of the progress

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<sup>1</sup>U. S. Department of the Navy, Office of the Secretary, Inst. P10462.7B, p. III-1.

and/or problems of major programs and objectives of the Department of the Navy. In this Center, the Secretary and his principal assistants are briefed weekly on the status of these objectives and programs. The briefings are presented by experts on the subjects under discussion and serve to pinpoint major management problems for the information and action of the highest-level officials of the Department.

Office of Information Systems Planning and Development (OISPD).--This Office was established by Secretary of the Navy Instruction 5340.83 in September 1967<sup>1</sup> and replaced what were formerly the Systems Automation and Systems Development Divisions of the old Office of Management Information. Additionally, new responsibilities have been undertaken, particularly in the systems planning and standardization areas.

The long run objective of the OISPD is to attain at all levels within the Department of the Navy optimal cost/effective management of the manpower, money, material and information resources. An adjunct to this objective is the desire to maximize the Navy's contribution toward achieving this position in the entire Department of Defense. To achieve this goal, OISPD must ensure the development of information systems that are optimal cost/effective in the sense that they lead to optimal cost/effective decision making.

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<sup>1</sup>Ibid.



The characteristics of such decision making systems should, generally speaking, be:

1. Economically efficient--they should achieve the maximum development, installation and operating economies consistent with the objective of optimizing decision making cost/effectiveness.

2. Organizationally coherent--they should provide decision support tailored to the various Department of the Navy management levels, thereby ensuring for each manager support appropriate to his decision requirements and operational responsibilities. In other words, these systems must routinely provide useful support, fulfilling the requirements of top-level management as well as operational personnel.

3. Dynamically responsive--they must acknowledge the dynamic environment in which decision-making occurs, and must be capable of flexible adaptation to management's changing decision support requirements.

4. Broadly based--they must provide management with the broad, accessible and accurate data base necessary to satisfy the Department of the Navy's decision requirements. This data base should be available in the scope, form and timing consistent with the requirements at each level of management and should ensure that, no matter what aggregation of data that takes place, an audit trail back to the original disaggregated data base is preserved.

5. Fully supportive--they must make available to the decision makers a wide array of management science tools which will facilitate an evaluation of the past, control of the present, and forecasting of the future.<sup>1</sup>

To achieve information systems with the above mentioned characteristics, a wide variety of prerequisites exist. Probably the most fundamental, yet foremost in importance, is effective ADP management.

Effective ADP management forms the very foundation on which economically efficient information systems can be built. To minimize waste and inefficiencies, resources expended to meet similar requirements should not be duplicative or at cross-purposes with each other. The proliferation of systems must occur in a coherent manner to maximize their utility to decision makers throughout the Navy and to avoid the many pitfalls in haphazard development. Existing procedures and technology should not be "reinvented" simply because their existence is unknown to those engaged in systems design and development. Obviously, a centralized coordination of all aspects of systems planning and development is paramount to success in this dynamic field.

The primary mission of OISPD, as stated in the directive establishing it, is:

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<sup>1</sup>CAPT A.K. Bennett, USN, Presentation to Navy Graduate Financial Management Class.



To assure the expeditious and orderly development of management information systems throughout the Department of the Navy to insure appropriate information systems compatibility and to assure the full exploitation of automatic data processing and associated equipment.<sup>1</sup>

The specific functions which were also assigned by the same directive are indicative of the scope and nature of the tasks which this Office was created to handle. These functions are to:

a. Develop the basic concept, structure and criteria for guiding and governing integrated management information systems throughout the Department of the Navy.

b. Coordinate the management information systems development of the operating executives of the Navy Department to facilitate their convergence into appropriately integrated systems.

c. Provide staff support to the Navy Automatic Data Processing Policy Official (SASN).

d. Establish and sustain a comprehensive ADP standardization effort.<sup>2</sup>

To facilitate carrying out the important mission and functions assigned, OISPD has been organized to contain five line divisions and two staff groups which report to a Director and a Deputy Director. Exhibit (4) portrays the organizational structure of this Office.

The Coordination and Special Study Staff provides technical assistance to the Director. This staff is a means of bringing vast experience and technical skills to bear on

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<sup>1</sup>U. S. Department of the Navy, Office of the Secretary, Inst. 53430.83.

<sup>2</sup>Ibid.

unusual problems expeditiously; and provides the Director with strong technical support.

The other staff group, the Navy Management Review, consists at the present time of one editor and one secretary. The publication coming out of this office is directed toward management improvement. Future plans call for expanding the scope of the magazine to include articles on management information and control systems, new managerial developments and techniques, and new developments in ADPE and ADP systems of interest to all levels of the Navy.

The five line divisions of OISPD and their assigned span of responsibilities are as follows:

1. Information Sciences and Systems Planning Division--The missions of this division are to develop mid and long range plans and goals for Department of the Navy management information sciences. Concepts and plans are formulated in direct response to ADP system and ADPE requirements as determined by Heads of Departmental components. The mission of this division includes guiding the development and integration of these mid and long range plans in keeping with state-of-the art technology in order to increase the effectiveness with which existing ADP hardware and other resources are utilized.
2. Information Systems Standards Division--This division has the mission of establishing and sustaining a comprehensive ADP standardization program.



To carry out this task, the essential functions are: First, to research, develop, and establish for the Department of the Navy, new standard guidelines and criteria for ADP systems planning, ADP systems components (hardware, software, and related data), ADP systems management, and ADP systems reporting. This particularly includes the development and administering of plans, policies, and procedures for establishing and maintaining a comprehensive standardization program for data elements and codes; and for ADP programming languages and; Second, this division serves as the principal representative of the Special Assistant to the Secretary of the Navy and of the Director OISPD for contacts concerning the Department of the Navy Standardization Program, which are made with the Office of the Secretary of Defense, United States of America Standards Institute (USASI), National Bureau of Standards and others.

Information Systems Development Division--This Division functions to further the coordination and compatibility of management information systems; requests to the SASN for approval of information systems plans, ADP equipment requirements, and ADP contractual support are reviewed and evaluated. The Development Division oversees the shorter operationally-oriented portion of the systems planning cycle in order to ensure appropriate systems compatibility. This Division also conducts and monitors the ADP Resource Sharing and Reutilization Program.

Information Systems Review and Evaluation Division--The missions of this division include those of developing plans, policies and procedures for the conduct of a continuing review and evaluation program for Department of the Navy management information systems, ADP installations and other operating ADP systems as may be assigned.

\*ADP Management Division--This division was established to develop for approval by the Special Assistant to the Secretary of the Navy, policies and procedures for the reporting of all information required for both the administration, control, and development of information systems and also for a financial and cost/effectiveness analysis of these information systems. This information will necessarily be required for the support of the work of the SASN, the Chief of Naval Operations, the Commandant of the Marine Corps and information systems managers throughout the Department of the Navy.<sup>1</sup>

Automatic Data Processing Equipment Selection Office (ADPFESO).--The memoranda in 1966 from the White House and the Office of the Secretary of Defense concerning management and use of electronic computers gave additional momentum to several internal studies relating to the same subject by the Navy Department. Both documents recognized the ever-increasing importance of a requirement for effective management of what is rapidly becoming one of the Defense establishment's prime

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<sup>1</sup>CAPT A. K. Bennett, USN, Presentation to Navy Graduate Financial Management Class.



resources--computer based information systems. Acknowledgement was also made to the increasing capital investment being made in equipment and man-machine complexes in support of the national leadership.

A problem which had been faced by the Department of the Navy for several years had been that of devising selection techniques which would satisfy two fundamental criteria. The first criterion was the satisfaction of the immediate needs and requirements of the requesting activity. The second criterion, and much more difficult to solve, is the acquisition of computer equipment which would not require early and uneconomical replacement by higher-capacity equipment.

*selection criteria \**

In an effort to solve such problems, the Secretary of the Navy established, in February 1967, a Management Information and Control System (MICS) Task Force. This Task Force was placed under the guidance of the Special Assistant to the Secretary of the Navy. A Special Study Group consisting of representation from the Departmental Components was assigned to provide assistance.

*See Navy mgt Review*

One of the specific objectives assigned the MICS Task Force was the establishment of a new, professionally staffed organization would be charged with the evaluation and selection of automatic data processing equipment for the Navy Department.

A comprehensive study and evaluation was conducted and included examining such specific aspects of the over-all

problem as the: (1) Methodologies of evaluation and selection of ADPF employed by the Navy Department, other components of the Defense Department as well as both Government and non-Government agencies over a period of several years; (2) Recommendations of representatives of the ADP hardware and software industries; (3) Behavior of ADPE selection processes within the Department of the Navy and the other elements of the Defense Department over a period of time; and (4) Experiences of other centrally-organized ADPE evaluation and selection activities.

Based on the examination of those aspects mentioned above and many others, the Study Group was able to arrive at some conclusions as to methodological and organizational concepts regarding the evaluation and selection of ADPE for the Navy. These findings were submitted to and subsequently approved by the SASN. This led to the establishment of the Navy Automatic Data Processing Equipment Selection Office on 1 July 1967 in Washington, D. C.<sup>1</sup>

The primary mission of ADPESCO, as stated in the Directive establishing it, is:

- a. To evaluate and select, for approval by the Special Assistant to the Secretary of the Navy (SASN), automatic data processing equipment to be acquired by the Department of the Navy . . .

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<sup>1</sup>Interview with CDR Gerald D. Sylvester, USN, Deputy Director, Automatic Data Processing Equipment Selection Office, February 1968.



- b. To act as the Department of the Navy contracting office for the procurement of ADPE.<sup>1</sup>

The mission does not include validation, evaluation, selection or procurement of:

- a. Equipment integral to weapons systems and shipboard tactical data systems;
- b. Equipment integral to non-ADP systems, procured as part of a system. (For example, if a system of components is to be procured and one component happens to be a computer, then the selection of that particular computer remains the responsibility of the system contracting officer.);
- c. Punched card equipment; and
- d. Special purpose ADPE exempted by the SASN on an individual case basis.

*See  
MMR  
article*

The new Selection Office serves as the Navy's principal point of contact with private industry with regard to matters pertaining to validation, evaluation, selection and procurement of automatic data processing equipment. It develops and administers plans, procedures and methods governing ADPE specification preparation, proposal solicitation, the validation and evaluation of proposals and the selection of ADPE sources. It is also responsible for soliciting such proposals, negotiates contracts, and places purchase and delivery orders for selected ADPE.<sup>2</sup>

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<sup>1</sup>U. S. Department of the Navy, Office of the Secretary, Establishment of the Automatic Data Processing Equipment Selection Office, Inst. 5430.81, 30 June 1967.

<sup>2</sup>Ibid.

As a result of recommendations made by the Assistant Secretary of the Navy for Installations and Logistics, the responsibility for formal contract negotiation and award for selected ADPE is included in the mission of the ADPESO. This ~~responsibility is included in the mission of the ADPESO.~~ the requirements of "Being most advantageous to the Government and, thus, to the U. S. Navy by having both the 'technical aspects'--such as ADPE systems analysis--and the 'non-technical' aspects--such as contractual regulations and procedures--performed aggressively and efficiently." Previous selection and procurement procedures called for the procuring contracting officer to have only limited involvement in the complete cycle. In many cases the procuring contracting officer became involved after the source selection had already been made.<sup>1</sup>

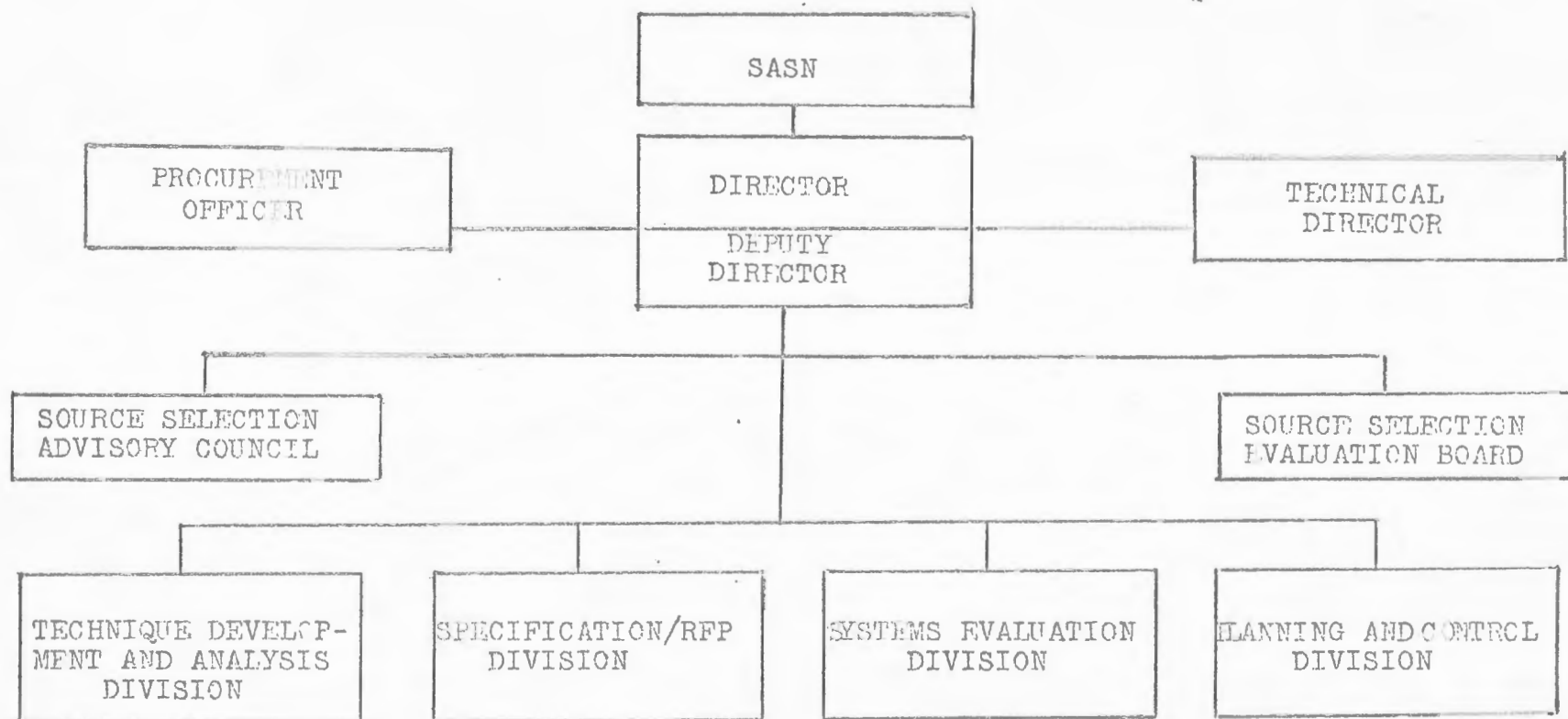
To carry out its mission and perform the functions assigned, ADPESO is organized with four line divisions. See Exhibit (5).

The Technique Development and Analysis Division is charged with continuing examination and improvement of equipment testing, evaluation, and selection techniques. It also has the same responsibility for timing and simulating techniques, evaluation methodologies, and for pre-qualifications of ADP hardware and related software.

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<sup>1</sup>Norman P. Adelson, "ADPE Selection Office to Analyze New Approaches to Navy Computer Procurement," Naval Personnel Review, Vol. XII, (September 1967), p. 6.





AUTOMATIC DATA PROCESSING EQUIPMENT SELECTION OFFICE

The Specifications and Request-for Proposal (RFP)  
Division is responsible for close liason with users and  
prospective users of ADPE within the Navy Department. Pre-  
paration of RFP's, validation of equipment specifications,  
technical liason with suppliers of hardware and related soft-  
ware and screening of proposals are the major functions it  
 performs.

The Systems Evaluation Division is charged with the  
validation and evaluation of proposals for hardware and re-  
 lated software in the generic categories of technical per-  
formance, vendor support and cost effectiveness. It also  
 briefs and debriefs vendors and develops selection plans.

Administrative support to the Selection Office is pro-  
 vided by the Planning and Control Division. Along with coor-  
 dinating RFP's and conducting all procurement functions, it  
 also acts to manage and control the internal workload of  
 ADPESO.<sup>1</sup>

#### Policies and Operating Procedures

The general philosophy of the Navy with regard to systems  
 development, design and management can best be summed up in the  
 following article:

*top mgmt participation*

. . . . The specifications of objectives, allocation  
 of resources, establishment of priorities, develop-  
 ment of standards, identification of ultimate manage-  
 ment information needs and the resolution of any and  
 all lower level conflicts can only proceed via the  
 high road from top management.

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<sup>1</sup>Interview with CDR Gerald D. Sylvester, USN, op. cit.



. . . Only top management knows its sense of responsibilities, and knows its expectations as to its future goals. And only top management knows what it already knows, and what it needs and wants to know . . . This is why systems planning must proceed centrally from the topmost management level.

On the other hand, fulfillment of information requirements, the generation and development of the actual data base, the actual system design can best (if not only) be evolved via a bottom to top approach . . . most importantly, this enables the construction of a sound information system by starting at the information sources.<sup>1</sup>

System development procedures.--The basic responsibility for the development and operation of management information and data systems rests with heads of Departmental Components. A Secretary of the Navy Directive provides the coordination required to assure maximum compatibility for management purposes.<sup>2</sup>

Departmental components develop annually a Management Information System Plan (MISP). This plan identifies the total information requirements of the component and illustrates how these requirements are presently being filled by existing systems. Based on this, informational deficiencies are identified and a proposed plan, including priorities and a time schedule, to meet these deficiencies is provided. The MISP time

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<sup>1</sup>W. Henry Hill and Jack H. Wright, "Concept and Design of Integrated Management Information Systems," Data Processing Year Book, 1964, p. 117.

<sup>2</sup>U. S. Department of the Navy, Office of the Secretary, Management Information and Data Systems; Plans and Procedures For, Inst. 5200.14, November 3, 1965.

frame is limited to the ensuing program year and is projected four years beyond the program year. The MISP's submitted by the Departmental components are compiled into the overall Department of the Navy plan which is approved by the SASN and promulgated throughout the Department for information and guidance.

Based on the approved ~~M~~ISP, the Departmental components will conduct feasibility studies and the results of these studies will be a Systems Design Proposal (SDP). The SDP will enumerate the specific information deficiencies the proposed system will satisfy and additionally, will provide a cost benefit analysis of the proposed system with respect to the present system. The SDP also specifies the probable resource requirements including equipment, personnel, facilities, and communications. An SDP is not required for systems completely internal to a Departmental component or if a system is not altered but only requires additional equipment. X

The submitted SDP is reviewed by OISPD. At this point, the necessary coordination with other Departmental components is established and appropriate action is recommended to SASN in the form of Approved System Requirements (ASR). The ASR will include definite information regarding specific design criteria and standardization requirements. Documentation criteria ~~is~~ *are* also established for the System Description and Implementation Plan (SD/IP) and the Final Pre-Installation System Evaluation (FPSE). The SD/IP should be a comprehensive analysis of the



present system and should include specifically: (1) the source of all input data, (2) the purpose of each element of output, (3) equipment requirements including the proposed source, e. g. present installation, sharing, reutilization of existing equipment or new acquisition, (4) cost benefit analysis between present and proposed systems, (5) implementation schedule and (6) Data Systems Specifications.

Data Systems Specifications are an output result of the systems design phase, and serve as the connecting link between systems design and equipment selection and acquisition. Systems Specifications are developed independently of any manufacturer's hardware - software package. Selection is based on approved specifications. A recent development in Navy ADP management is standard Data System Specifications. The standardization of Specifications is but one of the many moves toward standardization of the developmental and implementation phases of the ADP program. Although the new System Specifications have not been officially published, they are being utilized at this time.<sup>1</sup>

Selection and Acquisition Procedures.--Data Systems Specifications and the associated Request for Procurement (RFP) are prepared by the requiring organization and forwarded to SASN for his approval as Source Selection Authority and ADP Policy Official. The ADPE Selection Office provides staff

*not quite correct*

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<sup>1</sup>Interview with CDR Gerald D. Sylvester, USN, op. cit.

support to SASN in the review of the Specifications and RFP prior to his approval.

Upon receipt of the approved Data System Specifications and RFP, a Source Selection Evaluation Board (SSFB) is established by the Director, ADPFSO. This Board serves to develop an evaluation plan and to prepare the approved Specifications, RFP, and solicitation letters for issue to qualified suppliers.

Membership of the SSFB include personnel from the Specification and RFP Division and the Systems Evaluation Division of ADPFSO, personnel from the Departmental Component of the requesting organization, if required, and the ADPFSO Contracting Officer.

A Source Selection Advisory Council (SSAC) is appointed by the SASN. Membership will be composed of ADPFSO personnel and representatives of the Departmental Component requesting the equipment. This Council is responsible for reviewing the final Specifications, RFP, and letters of solicitation prior to issue. Upon approval by SSAC, ADPFSO then issues the solicitation letters and Requests for Proposals.

Validation and evaluation of replies are performed by the Source Selection Evaluation Board. In the case of sole-source acquisitions, validation of ADPE and related software will also be performed by the SSFB. It will present its documented findings to the Advisory Council. Based on the evaluation and other pertinent factors, the Advisory Council will recommend



a source selection and send its recommendations to the SASN for his action. At the same time, the recommendation is sent to the SASN, ADPESO furnishes the source selection recommendation to the Head of the Departmental Component of the requesting organization. This enables the Department Component an opportunity to comment on the recommendation prior to action by the SASN.

Subsequent to approval by the SASN of the selected source or sources of equipment, the ADPESO contracting officer initiates appropriate procurement action.<sup>1</sup>

The inclusion of contracting personnel in the entire ADPESO selection process has many benefits to offer the Navy ADP Program. These benefits, although not all inclusive, include compliance with existing procurement procedures with possible cost savings through knowledgeable negotiations in the case of quantity procurements and, perhaps more important, a means for developing computer procurement expertise. This expertise in all aspects of ADPE procurement has been lacking due to the previously decentralized selection and procurement actions. Although the vast majority of ADPE acquisitions are against GSA established Federal Supply Schedule contracts, a thorough knowledge of all facets of the FSS and Armed Services Procurement Regulations (ASPR) is of paramount importance.

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<sup>1</sup>U. S. Department of the Navy, Office of the Secretary, Automatic Data Processing Equipment Acquisition; interim procedures for, Notice 10462, September 5, 1967.

The involvement of procurement specialists through the entire selection process is expected to result in more efficient and economical acquisitions.<sup>1</sup>

ADP Program Reporting.--The Bureau of the Budget ADP Management Information System as promulgated by Circular A-83 is used as the primary data collection vehicle for Navy ADP program reporting. Information obtained through this system is used at all management levels to shape policies in the management of ADP resources and to justify budget submissions. Several modifications to the requirements of Circular A-83 have been incorporated to provide additional and more timely management information to the SASN. These include:

1. Quarterly reporting of computer utilization in lieu of semiannual reporting,
2. Annual reporting of Navy ADP Management Data for installed computers and semiannually for projected computers included in inventory reports. This basic data involves applications and programming languages,
3. Summary ADP Manpower and Cost information for one year beyond the budget year as defined by Circular A-83.<sup>2</sup>

The Program Reporting requirements provide OISPD with a source of information upon which operating effectiveness can be evaluated.

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<sup>1</sup>Norman P. Adelson, op. cit., pp. 8-10.

<sup>2</sup>U. S. Department of the Navy, Office of the Secretary, Automatic Data Processing Program Reporting, Notice 10462, May 23, 1967.



Automatic data processing resource sharing.--Secretary of the Navy Instruction P10462.7B, Appendix C, outlines the requirement for activity participation in the Government-wide ADP Resource Sharing Program. Activities are enjoined to utilize, to the fullest extent feasible, the facilities of Government-owned, and Government-owned contractor operated facilities prior to requesting additional resources.

In January 1967, the Navy signed a sharing agreement which provided for the use of the Federal Communications Commission computer in Washington, D. C. The savings generated by this sharing agreement is estimated to exceed \$500,000.<sup>1</sup>

Equipment re-utilization screening procedures.--Procedures governing the reutilization screening program are contained in Secretary of the Navy Instruction 10462.7B, Appendix D. Policy guidance for this program is contained in Department of Defense Instruction 4160.19, Re-Utilization Screening of Automatic Data Processing Equipment. These directives require an in-house screening to find possible secondary users of excess equipment. If no requirement exists within the Department, the equipment is then reported to the Defense Supply Agency (DSA) for DOD-wide screening. If there are no secondary users within DOD, the equipment is reported to the General Services Administration for Government-wide reporting.

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<sup>1</sup>House Committee on Government Operations, Hearings on Data Processing Management in the Federal Government, p. 52.

The requirement exists also for all organizations requiring additional equipment to screen both GSA and DOD excess listings prior to initiating requests for new acquisitions.

The DOD instruction is not explicit as to when in the acquisition process the screening should take place. Current practice within the Navy is that the screening and possible utilization choice may be made at any time until final selection approval action is taken by the SASN.

Standardization efforts.--In order for information systems to exchange data and information they must be able to communicate and to be compatible. It is imperative, therefore, that these systems "must be provided with, and be governed by, a comprehensive program for standardization of data elements, transactions, developmental techniques, operating conventions, and equipment characteristics as presented to the user."<sup>1</sup> The Navy Department, in recognition of these requirements, is pursuing a comprehensive program to establish ADP standards to strengthen its ADP operations and, thereby, improve its management information system.

The first four areas selected for standardization efforts are: (a) the use of a uniform language; (b) standard data elements and codes; (c) common techniques of problem definition, and (d) a single set of documentation procedures.

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<sup>1</sup>Interview with William H. Singleton III, Information Systems Standards Division, Office of Information Systems Planning and Development, Department of the Navy, February 1967.



The initial effort toward language standardization has been aimed towards COBOL. Implementation of this standard will result in many benefits to the Navy, e. g. reduction in training time for programmers, more flexibility in personnel shifting and with less time having to be spent learning the language and with fewer languages to learn, the programmers will be able to spend more time developing a real proficiency in his field.

The Navy's Standard Data Elements and Codes Program is responsive to the DOD Standardization Program. Progress is being made toward prescribing standard conventions and procedures for identifying "data elements" and "codes" in all systems. This will facilitate the implementation of DOD standards. To supplement the DOD standards, the Navy will publish a dictionary for unique Navy standard data elements and codes.<sup>1</sup>

To facilitate and improve planning, integration and control of information systems, efforts are being directed toward establishment of uniform guidelines to describe systems by "problem definition" during their developmental period. Methods and procedures will spell out the detailed steps involved in the initial definitions, designs, and implementation of information systems. This area of standardization should make descriptive documentation more understandable and concise, thereby improving systems design and specifications.

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<sup>1</sup>Ibid.

Concentration of effort on standardized documentation procedures will result in elimination of duplicity of effort, and will facilitate integration and exchange of information among systems.

Progress toward the future.--At the present time, the Navy's ADP Program is engaged in a number of programs which are directed toward the accomplishment of making available to all echelons of management the right information at the right time and within an acceptable time frame. This will have the additional effect of providing better cost/effective decision-making at all management levels.

Some of the more significant programs now underway are:

1. Development of an ADP system developmental discipline including documentation submission requirements and procedures. This is expected to provide congruence to systems reporting and thus to systems management as well. Progress is being made toward a complete rewriting of the ADP manual consistent with progress and policy changes.
2. Promulgation of Departmental mid and long range ADP plans. This will provide guidelines for future system developments.
3. Development of ADP system review and evaluation procedures.
4. Establishment of a Navy Department ADP systems inventory and required maintenance file.



5. Development of budget disciplines which will identify the specific cost of the ADP research and development, implementation, and maintenance steps.

6. Implementation of standard programming languages to promote future integration and cross connection of Departmental management information systems.

7. ~~Establishment of standard criteria for equipment selection which will insure that all important requirements are considered, thereby improving the objectivity and effectiveness of the choice of ADPF.~~<sup>1</sup>

Completion of the above programs and objective development of new improvements will provide significant benefits to the Navy's ADP resources, combined with cost and utilization data, and retrievable in many formats under improved control procedures, will support managers in pinpointing and eliminating unacceptable duplications, inefficiencies and waste; and in validating ADP systems requirements before scarce funds are irrevocably committed, with the objective of making maximum possible use of existing capabilities. Establishment of standards for system design, operation and documentation along with up-to-date technological information will provide for improved ADP management.

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<sup>1</sup>CAPT A. K. Bennett, USN, Op. cit.

## CHAPTER IV

### AUTOMATIC DATA PROCESSING MANAGEMENT AND THE FUTURE

#### Early Government-wide Problems

Spontaneous growth.--In the relatively short span of time since the introduction of the first general purpose computer at the Bureau of the Census in the Department of Commerce, the use of electronic computers in automatic data processing systems has experienced a dynamic growth. This explosive growth has led to investments by, or at the expense of, Federal agencies in the billions of dollars in efforts to develop and install computers and computer systems for use in a wide assortment of activities. The investment in this vast array of activity represents costs incurred for development and use of computers and computer-related devices, communications facilities, and physical plant facilities; site preparation; purchase, rental and maintenance of equipment; machine programs; data processing systems; procedures; software; data banks; personnel; training; travel; miscellaneous equipment and fixtures; contractual services for hardware and software; and other related items. Indeed, this expansion has appropriately caused the electronic computer and automatic data processing systems to be regarded as a major and vital resource to accomplish the primary program responsibilities of most Federal agencies.



Unfortunately, this growth and development has not been orderly by any means. In response to promises or hopes of greater economies and effectiveness, agencies unwisely acquired ADP equipment for inadequately developed systems; programs were written before systems were properly designed; and, operations were conducted with these inadequate programs. In general, the haste to be effective and economical resulted in ill-conceived systems that were unrelated and incompatible.

Early management concern.--Early management policies regarding computers and ADP were merely extensions of existing policies applicable to punched card equipment, calculators and other office labor saving equipment. Concern shown by the Bureau of the Budget over ADP management was essentially limited to the annual budget review processes. By the late 1950's, however, with the tremendous expenses being generated, it soon became apparent to both the Executive and Legislative Branches that more efficient use of Government ADP resources was necessary. Consequently, in 1958, the Bureau of the Budget undertook a comprehensive Government-wide ADP Responsibilities Study. This study recognized the need for specialized management of ADP resources, for Government-wide coordination, and for accurate current information for all levels of management. The study concluded that "dynamic leadership" in Federal ADP management was of "vital necessity".

The energetic coordination espoused by the Responsibilities Study never really materialized. The dynamic leadership was limited to the issuance of advisory guidelines to the various agencies by the Bureau of the Budget. These guidelines and bulletins covered feasibility studies, lease versus purchase evaluations, inventory reports, and sharing programs.

In the meantime, the General Accounting Office was conducting comprehensive audits and studies in the area of ADP management, utilization and acquisition. The results of these reports revealed serious shortcomings in the acquisition and use of ADP in various agencies. Most of the deficiencies constituted violations of the Bureau of the Budget guidelines. In addition to the audit reports, the GAO submitted four comprehensive ADP management studies to Congress. These studies strongly recommended centralized coordination of the Government's ADP effort.

Problem identification.--In February 1965, at the request of Congress, the Bureau of the Budget issued a report to the President on the Management of Automatic Data Processing in the Federal Government. This report resulted from a comprehensive study of all aspects of ADP management conducted for the Bureau of the Budget by a specially appointed Advisory Committee and Project Staff. The report was favorably received by the President and transmitted to the Congress in March 1965.



It concluded that there was a clear need to "strengthen the resources devoted to the management of ADP within both the central agencies and the line departments". The findings did not differ greatly from those revealed in the 1959 study.

Identification was made of a number of significant management deficiencies. Generally speaking, the more important of these problems were:

1. Inadequate systems analysis and systems design were not taking into consideration all of the potentials and developments in the new technology.
2. There was no Government-wide automatic data processing management information system.
3. There were no procedures for the exchange of data processing information within and between the operating agencies. This caused redundancies and placed additional financial and manpower strains on the Government.
4. Selection and acquisition procedures were inefficient.
5. There was a high degree of incompatibility between systems. This shortcoming made it very difficult to exchange information between systems in addition to being expensive in terms of time and money. Also, this created problems in sharing of resources among the various agencies.
6. There were no accepted criteria for appraising operating efficiency.

7. Low utilization of many automatic data processing installations resulted in excessive equipment inventories and costs to the Government.

Current Government-wide coordination.--As a result of the report, the Bureau of the Budget was directed to set forth in a Circular, specific Government-wide responsibilities of the Bureau of the Budget, the General Services Administration and the Department of Commerce to carry out the recommendations made. Bureau of the Budget Circular A-71, Responsibilities for the administration of automatic data processing activities, was issued accordingly.

Congressional hearings and investigations concerning the Government's management of ADP resources were numerous. In 1963, hearings were held by the House Committee on Post Office and Civil Service. Primary concern at this time was directed at the impact of ADP on Federal employees. During the same year, the House Committee on Government Operations conducted hearings on the use of ADP in the Government. In 1965, Congressman Jack Brooks of Texas successfully sponsored a bill providing for the efficient purchase, lease, maintenance, operation and utilization of automatic data processing equipment in the Federal Government. This bill became Public Law 89-306 and assigned specific responsibilities to the General Services Administration, the Department of Commerce and the Bureau of the Budget. Certain responsibilities were specifically reserved to using agencies.



In 1966, the President enjoined all agencies to endeavor to make maximum utilization out of the computer in their operations while managing computer activities at the lowest possible cost.

In its initial progress report to the President, the Bureau of the Budget cited some significant advances with respect to management of this vital and costly resource. However, considerably more effort must be expended to keep up with the ever growing ADP systems and advancing technology.

To date, principal actions implementing Circular A-71 and Public Law 89-306 have pertained to expansion of the Government-wide ADP Reporting System as promulgated by Circular A-83 and extension of the ADPE re-utilization and sharing programs by the General Services Administration.

The Department of the Navy's Program for Action

Coordination of effort.--The call for action toward further exploitation and more efficient management of the computer initiated by both the President and the Secretary of Defense has been met by the Navy Department. This response is best illustrated by the formation, current undertakings, accomplishments and objectives of the Office of Information Systems Planning and Development and the ADPE Selection Office.

The introduction of computers within the Government has accelerated within the past few years. This acceleration has

been experienced in the Navy also. Of the estimated over 3000 computers within the Government today, the Navy Department has, under its cognizance, nearly 18% of this total.<sup>1</sup> The magnitude of the problems associated with the management of the ADP program can be projected to the future when one considers that current estimates predict that the number of Government computers is expected to double by 1975.

The precise inter-relationship between effective ADP management and efficient, organizationally sound, responsive, and supportive information systems is apparent. The OISPD, with its assigned missions and functions, is geared for maximum utilization of the scarce resource that can be expected to be even more limited in the future--skilled manpower. Some of the significant programs underway now and in the development stages should produce early achievements in the effective management of the Navy's ADP resources.

The ADPE Selection Office is organized toward fulfilling two fundamental objectives; First, the optimal satisfaction of the ADPE requirements of the Navy Department not only now, but in the future; and second, the development of a uniform approach to the selection and acquisition of ADPE. This separate entity of evaluation, selection and acquisition of requirements should provide a base for professional expertise in this area. Uniformity of selection criteria will help to insure that all

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<sup>1</sup>CAPT A. K. Bennett, USN, Op. cit.



important requirements are considered and should improve the objectivity and effectiveness of the choice of ADPE.

The challenge of the future.--Although considerable time and effort has been expended in establishing ADP standards, it is strongly felt that more concentration should be directed toward the development, promotion and utilization of these standards. The planners for the future ADP systems must have a uniformity upon which to build these new systems. The areas of data elements and codes, documentation, systems development, uniform performance criteria, and uniform data collection and input techniques are but a few of the many urgent areas for standardization focus.

With continued acceleration of growth projected not only within the Government but also within the private sector, competition for professionally competent personnel will become even more acute than is presently being experienced. Future ADP progress will depend, to a large extent, upon the expertise in management, uniformity of systems, and the ability to plan intelligently for the future.

While some objection is being raised concerning the degree of centralization being imposed upon the ADP program, it is felt that coordination of all effort is necessary in order to cope most effectively with the problems of growth and competition for the scarce resources. The challenge of the future can be met if concentration is focused on the fact that the computer must be the servant and not the master in the management process.

APPENDIX

Public Law 89-306  
89th Congress, H. R. 4845  
October 30, 1965

AN ACT

To provide for the economic and efficient purchase, lease, maintenance, operation, and utilization of automatic data processing equipment by Federal departments and agencies. ]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title I of the Federal Property and Administrative Services Act of 1949 (63 Stat. 377), as amended, is hereby amended by adding a new section to read as follows:

"AUTOMATIC DATA PROCESSING EQUIPMENT

"Sec. III. (a) The Administrator is authorized and directed to coordinate and provide for the economic and efficient purchase, lease, and maintenance of automatic data processing equipment by Federal agencies.

"(b) (1) Automatic data processing equipment suitable for efficient and effective use by Federal agencies shall be provided by the Administrator through purchase, lease, transfer of equipment from other Federal agencies, or otherwise, and the Administrator is authorized and directed to provide by contract or otherwise for the maintenance and repair of such equipment. In carrying out his responsibilities under this section the Administrator is authorized to transfer automatic data processing equipment between Federal agencies, to provide for joint utilization of such equipment by two or more Federal agencies, and to establish and operate equipment pools and data processing centers for the use of two or more such agencies when necessary for its most efficient and effective utilization.



"(2) The Administrator may delegate to one or more Federal agencies authority to operate automatic data processing equipment pools and automatic data processing centers, and to lease, purchase, or maintain individual automatic data processing systems or specific units of equipment, including such equipment used in automatic data processing pools and automatic data processing centers, when such action is determined by the Administrator to be necessary for the economy and efficiency of operations, or when such action is essential to national defense or national security. The Administrator may delegate to one or more Federal agencies authority to lease, purchase, or maintain automatic data processing equipment to the extent to which he determines such action to be necessary and desirable to allow for the orderly implementation of a program for the utilization of such equipment.

"(c) There is hereby authorized to be established on the books of the Treasury an automatic data processing fund, which shall be available without fiscal year limitation for expenses, including personal services, other costs, and the procurement by lease, purchase, transfer, or otherwise of equipment, maintenance, and repair of such equipment by contract or otherwise, necessary for the efficient coordination, operation, utilization of such equipment by and for Federal agencies: Provided, That a report of equipment inventory, utilization, and acquisitions, together with an account of receipts, disbursements, and transfers to miscellaneous receipts, under this authorization shall be made annually in connection with the budget estimates to the Director of the Bureau of the Budget and to the Congress, and the inclusion in appropriate acts of provisions regulating and the operation of the automatic data processing fund, or limiting the expenditures therefrom, is hereby authorized.

"(d) There are authorized to be appropriated to said fund such sums as may be required which, together with the value, as determined by the Administrator, of supplies and equipment from time to time transferred to the Administrator; shall constitute the capital of the fund; Provided, That said fund shall be credited with (1) advances and reimbursements from available appropriations and funds of any agency (including the General Services Administration), depreciation of equipment, provision for accrued leave, and for amortization of installation costs, but excluding, in the determination of rates prior to the fiscal year 1967, such direct operating expenses as may be directly appropriated for, which expenses may be charged to the fund and covered by advances or reimbursements from such direct appropriations) and (2) refunds or recoveries resulting from operations of the fund, including the net proceeds of



disposal of excess or surplus personal property and receipts from carriers and others for loss of or damage to property: Provided further, That following the close of each fiscal year any net income, after making provisions for prior year losses, if any, shall be transferred to the Treasury of the United States as miscellaneous receipts.

"(e) The proviso following paragraph (4) in section 201 (a) of this Act and the provisions of section 602 (d) of this Act shall have no application in the administration of this section. No other provision of this section shall be applicable in the administration of this section.

"(f) The Secretary of Commerce is authorized (1) to provide agencies, and the Administrator of General Services in the exercise of the authority delegated in this section, with scientific and technological advisory services relating to automatic data processing and related systems, and (2) to make appropriate recommendations to the President relating to the establishment of uniform Federal automatic data processing standards. The Secretary of Commerce is authorized to undertake the necessary research in the sciences and technologies of automatic data processing, computer and related systems, as may be required under provisions of this subsection.

"(g) The authority conferred upon the Administrator and the Secretary of Commerce by this section shall be exercised subject to direction by the President and to fiscal and policy control exercised by the Bureau of the Budget. Authority so conferred upon the Administrator shall not be so construed as to impair or interfere with the determination by agencies of their individual automatic data processing equipment requirements, including the development of specifications for and the selection of the types and configurations of equipment needed. The Administrator shall not interfere with, or attempt to control in any way, the use made of automatic data processing equipment or components thereof by any agency. The Administrator shall provide adequate notice to all agencies and other users concerned with respect to each proposed determination specifically affecting them or the automatic data processing equipment or components used by them. In the absence of mutual agreement between the Administrator and the agency or user concerned, such proposed determinations shall be subject to review and decisions by the Bureau of the Budget unless the President otherwise directs."



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